ANNUAL **PERFORMANCE** PLAN 2024/25

science & innovation

Department:
Science and Innovation
REPUBLIC OF SOUTH AFRICA

technology innovation
A G E N C Y
Innovating Tomorrow Together

Contents

1. List of abbreviations

4IR	Fourth Industrial Revolution
AI	Artificial Intelligence
AMITD	African Medicines Innovation and Technology Development Platform
API	Application Programming Interface
APP	Annual Performance Plan
B-BBEE	Broad-Based Black Economic Empowerment
bn	Billion
BRICS	Brazil, Russia, India, China and South Africa
COVID-19	Coronavirus Disease 2019
CSIR	Council for Scientific and Industrial Research
DDM	District Development Model
DSI	Department of Science and Innovation
FBIC	Forestry Bio-industry Cluster
GDP	Gross Domestic Product
GERD	Gross Expenditure on Research and Development
HEI	Higher Education Institution
HESTIIL	Higher Education, Science, Technology and Innovation Institutional Landscape
HIV/AIDS	Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome
ICT	Information and Communication Technologies
IDC	Industrial Development Corporation
IK	Indigenous Knowledge
IKS	Indigenous Knowledge Systems
IP	Intellectual Property
m	Million
MTEF	Medium-Term Expenditure Framework
MTSF	Medium-Term Strategic Framework
NACI	National Advisory Council on Innovation
NDP	National Development Plan
OTT	Office of Technology Transfer
NSI	National System of Innovation
PFMA	Public Finance Management Act
R&D	Research and Development
RDI	Research, Development and Innovation
SaaS	Software as a Service
SADC	Southern African Development Community
SDGs	Sustainable Development Goals
SET	Science, Engineering and Technology
STI	Science, Technology and Innovation
SMME	Small, Medium and Micro Enterprise
TIA	Technology Innovation Agency
TRL	Technology Readiness Level
TSP	Technology Stations Programme
UNCTAD	United Nations Conference on Trade and Development
TVET	Technical and Vocational Education and Training
VC	Venture Capital

2. Executive Authority Statement

The Annual Performance Plan (APP) 2024/25 of the Technology Innovation Agency (TIA) identifies the outputs, output indicators, and targets that the Agency aims to achieve in the 2024/25 financial year. TIA's APP 2024/25 is informed by the National Development Plan (NDP) 2030, the Medium-Term Strategic Framework (MTSF) 2019-2024, the Economic Reconstruction and Recovery Plan, and the District Development Model (DDM).

It also considers relevant National System of Innovation (NSI) policies, specifically the White Paper on Science, Technology and Innovation, the Science, Technology and Innovation Decadal Plan 2020, and the Bio-economy Strategy. The APP 2024/25 considers the Sustainable Development Goals (SDGs) of the United Nations' Agenda 2030 and the African Union's Agenda 2063.

The APP 2024/25 is aligned with TIA's Strategic Plan for 2020-2025 in addition to the Agency's mandate, as per the Technology Innovation Agency Act (No 26 of 2008). It will be implemented with the oversight of TIA's Accounting Authority, the Board. Implementation of the APP 2024/25 will be monitored through quarterly and annual performance reporting to TIA's shareholder, the Department of Science and Innovation (DSI).

The Annual Performance Plan (APP) 2024/25 of the Technology Innovation Agency (TIA) identifies the outputs, output indicators and targets that the Agency aims to achieve in the 2024/25 financial year.

Dr Bonginkosi E. Nzimande, MP
Minister of Higher Education, Science and Innovation
Executive Authority of the Technology Innovation Agency

3. Chairperson's Foreword

I am pleased to present the APP of TIA for the year 2024/25. This APP represents the last year of the Agency's 2020-2025 Strategic Plan. This is against the backdrop of four consecutive years of positive achievements, being 90%, 90%, 86%, and 94% achievement against the Agency's predetermined output targets. TIA enters this financial year amid several important developments in the country, the economy, and the NSI.

- Firstly, this year coincides with the onset of the sixth administration that will commence its term following the national elections. This will have significant implications for policy direction and may pose systemic risks to the implementation of ongoing government programmes — especially in light of the budget cuts arising from the country's tight fiscal position.

- Secondly, the challenges besetting the country today, represent significant constraints on the economic growth and recovery and, therefore, undermine many efforts to address the challenges of poverty, unemployment, and equality. These include the energy crisis, deteriorating economic infrastructure that has led to disruptions in supply chains, and rising levels of inflation, which continue to plunge many people into food insecurity.

- Thirdly, the year represents the first of the implementation of the Decadal Plan approved by Cabinet in November 2022. This Plan articulates the priority interventions and investments in science, technology and innovation (STI), that would enable this sector to increase its contribution to South Africa's growth and development over the next ten years.

- Finally, at institutional level, this year marks the beginning of TIA's efforts to implement the recommendations from the Institutional Review commissioned by the Minister of Higher Education, Science and Innovation. The Ministerial Review contains a set of recommendations that primarily call for the organisation to play a more strategic role in catalysing the innovation ecosystem and ensuring that society derives maximum dividends from its investment in STI. The Board has, therefore, defined its strategic intent for TIA as a scaled-up and strategically positioned organisation that plays an effective curatorship role in the NSI. In this role, TIA will assume an appropriate stature in the NSI, providing thought leadership and positioning itself, and the country, for greatness.

This last APP will, therefore, focus on kickstarting the quick-win activities that largely centre around organisational reconfiguration and realignment.

Fundamentally, therefore, this year's APP is framed to respond to these developments, whilst working to close the current planning cycle with positive results. The current strategic socio-economic context calls for TIA to play a stewardship role; harnessing innovation as a policy tool to address the country's economic growth and recovery efforts, the deep-rooted and intractable socio-economic challenges of poverty, inequality, and unemployment - ultimately positioning South Africa as an important competitive player in the global economy.

The NSI has remained resilient and dynamic. With the growing maturity of our research system (that produces successful innovations for commercialisation and the start-up landscape) demonstrating growth in the number of companies launching products into the market. Having said this, however, much of the focus must be on strengthening the innovation ecosystem through interventions to increase effective technology transfer as well as human capital for innovation and technology entrepreneurship, the regulatory environment, system coherence, and funding for innovation. These factors continue to represent important challenges to be addressed in pursuit of achieving our goal of delivering a system that functions at maximum efficiency. With some of these factors being realised, South Africa can compete effectively with its counterparts in the emerging world and successfully function, on par, with its Brazilian, Russian, Indian, Chinese and South African (BRICS) counterparts.

In response to the current situation, the Board and Management of TIA has initiated a comprehensive process to create a new ten-year Corporate Strategy. This strategy involves a step-by-step development of TIA over the next decade. The plan is to build on the progress already made in the NSI and to restructure TIA for a phase of growth. The focus will be on significant systemic actions to enhance the conditions favourable for innovation. The aim is to increase TIA's long-term socio-economic impact by investing in high-impact strategic initiatives. These initiatives are expected to generate new industries and leverage South Africa's abundant natural resources.

This last APP will, therefore, focus on kickstarting the quick-win activities that largely centre around organisational reconfiguration and realignment, increased operational efficiencies, and a set of dynamic and systemic interventions focused on enhanced translation and commercialisation in the research and entrepreneurship/start-up landscapes.

On behalf of TIA Board, I wish to thank our colleagues at the DSI, the Director-General and his senior leadership, TIA Management, and the staff for all their contributions in putting this plan together.

Ms M Modise

Ms Matsi Modise
Chairperson of the Board

4. Chief Executive Officer's Overview

TIA's 2024/25 APP represents the final year of the implementation of the Agency's 2020-2025 Strategic Plan. Moving into 2024/25, TIA is focused on developing a new strategy that will lay the groundwork for a re-imagined organisation, one that is equipped to stimulate and accelerate innovation. This is viewed as a key driver of socio-economic growth and development.

The reimagination of TIA is the result of an expert panel review undertaken at the behest of the Minister of Higher Education, Science, and Innovation in 2022. The review report provided detailed findings and recommendations on various policy and strategic implementation issues that have affected TIA's ability to fulfil its mandate. The Agency is actively focused on responding to these recommendations as it prepares for the 2025-2030 strategic period.

Several 'quick wins' will be attended to in 2024/25. One of which is the investment management value chain. This includes the development and dissemination of new and existing support tools to assist investees who rely on TIA. The clear articulation of support tools is being put in place. This process includes TIA's investment framework (pre-investment, investment, and post-investment). The Agency needs to broadly improve its impact on the lives of South Africans and the economy, aggressively pursuing the commercialisation of technologies and resolving its operational inefficiencies.

TIA is on track to exceed its targets over the current five-year strategic cycle in relation to technologies commercialised and successfully demonstrated bio-based technologies.

An assessment of TIA's performance indicates that the Agency is on track to achieve the targets set in order to fulfil the 2020-2025 strategy. The outcomes or strategic priorities on which TIA focused, include commercialised innovations, delivering on the Bio-economy Strategy as well as the small, medium, and micro enterprises (SMMEs) supported through Technology Stations. The output indicators linked to these priorities include commercialised technologies, demonstrating bio-based technologies, bio-based entrepreneurs and organisations accessing high-end science, engineering and technology (SET) services, and SMMEs accessing SET services.

TIA is on track to exceed its targets over the current five-year strategic cycle in relation to commercialised technologies and successfully demonstrated bio-based technologies. More work needs to be done to ensure that TIA achieves its output target of bio-based entrepreneurs and organisations accessing high-end SET services. This must be achieved in the upcoming financial year, as progress in this regard is, to date, lagging. This analysis, therefore, serves as an important basis when planning for the year ahead.

TIA fulfils an important role in South Africa's innovation ecosystem. It provides risk funding to early-stage technologies derived from research output by publicly-funded intellectual property (IP), technology entrepreneurs and SMMEs. The goal is to translate this research output into commercialised technologies in the form of products and services. As part of strengthening performance in this area TIA is in the last stages of finalising the commercialisation enablement strategy. This strategy underpins concerted efforts aimed at economic transformation and job creation by supporting the exploitation of IP stemming from publicly funded Research and Development (R&D) to establish new sources of income, economic growth, and job creation. This strategy is being developed in a manner that takes considers TIA's renewal path towards TIA 2.0, which requires that operational inefficiencies be resolved to ensure fulfilment of the organisation's mandate.

On a very positive note, TIA received a rating of 8.9 out of ten in its annual stakeholder satisfaction survey. This indicates that the Agency is serving stakeholder needs and expectations quite well. This is the single highest score that TIA has received from this survey which is very encouraging. Lessons learnt from this period should be embedded in organisational processes and systems so that this performance is improved upon in a sustainable manner.

TIA notes with concern the budget cuts across all government entities, and this is a consequence, in part, of a struggling economy. This development emphasises the need for TIA to intensify efforts to collaborate with entities that have similar objectives so that it can expand its available resources within the ecosystem and benefit the Agency's programmes.

Mr Patrick Krappie
Acting Chief Executive Officer

5. Chief Financial Officer's Overview

TIA's Strategic Plan and APP, as a point of departure, acknowledges that the current economic pressures following the global COVID-19 pandemic and its aftermath, will remain the biggest area of focus for all segments of society. With 2024/25 being the fifth year of implementing the 2020–2025 Strategic Plan, TIA's 2024/25 APP has been designed to respond to the national economic challenges and appropriate responses and direction as set in the Decadal Plan. The annual plan emphasises efforts to enhance the commercialisation of technologies that concern the health of our people, food security, enhancement of our biological resource exploitation, and increasing investments in technologies that contribute to economic revival and the re-industrialisation of the South African economy.

The plans also focus on measures to support the SMME sector and to increase the participation of marginalised segments of society, such as people in townships, rural communities, women, youths, and persons with disabilities. With TIA having adopted the Broad-Based Black Economic Empowerment (B-BBEE) policy, more effort will be directed towards the empowerment of previously disadvantaged individuals through deliberate investment decisions, stakeholder engagements, and general mobilisation initiatives.

TIA operates with an annual budget of approximately R430 million. This is made up of a baseline of R159 million and R273 million of which is assigned as ring-fenced funding for 2024/25. The budget estimates for 2024/25 are well placed, based on the performance of the past four years. The Agency's planning cycle has prioritised effective cost-management solutions and continues to ensure that funds are appropriated in areas in which they are most needed.

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Baseline allocations for the Medium-Term Expenditure Framework (MTEF) period has reflected a decrease of R28 million in comparison to the previous year. Because of this, constraints exist on the amount of funding available for projects. Accordingly, there remains a large unfunded pipeline of investments, placing great emphasis on the Agency having to leverage additional funding by means of various partnership models.

In this environment, the Agency is challenged to intensify efforts to build partnerships that will bolster the execution of its mandate through co-funding initiatives, the exploitation of resources and other forms of expertise and capabilities across the NSI. This will enable TIA to continue playing an important role in promoting collaboration and co-ordination with other players in the NSI, in both the government and the private sectors. In line with its zero-based budgeting methodology, the Agency's budget is aligned with its strategic goals. All the components of the annual budget are relevant and cost-effective, based on reviews of previous years. The Agency maintains its drive towards improved savings.

In addition, the Agency will explore additional income sources to ensure its sustainability and reduce its reliance on funding from the fiscus. By implementing robust financial management, planning, and control, the Agency strives to ensure that 90% of the funding received is directed towards investment-related spending. This stringent target ensures that costs are maintained at the lowest possible level and that all financial efficiencies are maximised.

Mr Ismail Abdoola
Chief Financial Officer

6. Official Sign-off

It is hereby certified that this APP:

- was developed by the management of TIA under the guidance of TIA Board and the DSI;
- considers all the relevant policies, legislation, and other mandates for which TIA is responsible; and
- accurately reflects the impact, outcome, and outputs that TIA will strive to achieve during 2024/25.

Mr Brian Mphahlele
Executive: Commercialisation

Dr Vuyisile Phehane
Executive: Bio-economy

Mr Vusi Skosana
Acting Executive: Innovation Enabling

Mr Garth Williams
Head: Strategic Planning and Reporting

Ms Matshidiso Matlolane
Acting Executive: Corporate Services

Mr Ismail Abdoola
Chief Financial Officer

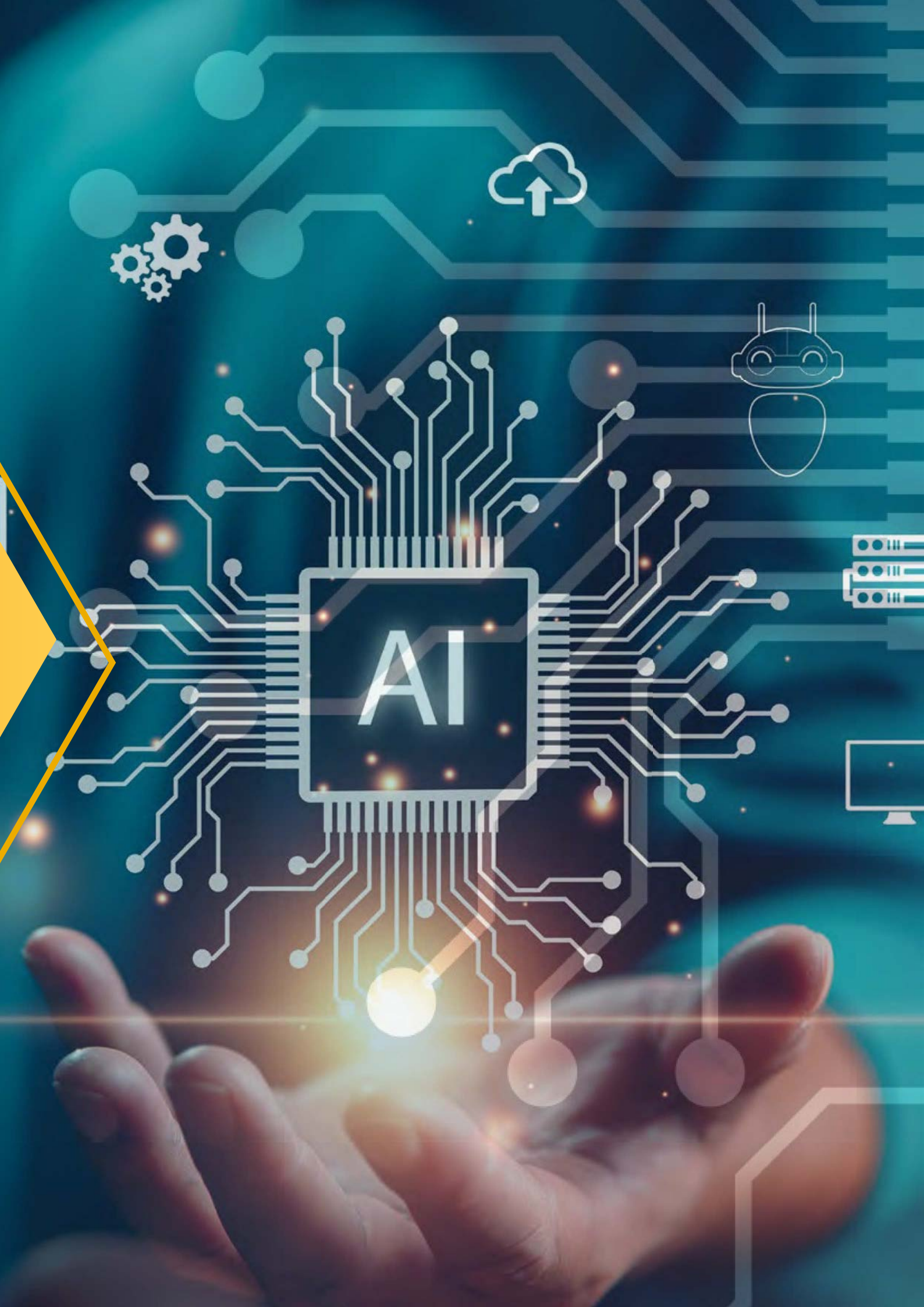
Mr Patrick Krappie
Acting Chief Executive Officer

Ms Matsi Modise
Chairperson of the Board

Minister Bonginkosi Nzimande
Executive Authority

PART A

MANDATE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7. Legislative Mandate

TIA was established as a schedule 3A public entity under the provisions of the Public Finance Management Act (PFMA) (Act 1 of 1999, as amended by Act 29 of 1999). Its mandate is derived from the provisions of the Technology Innovation Agency Act (26 of 2008), which establishes TIA as an agency that promotes the development and exploitation, in the public interest, of discoveries, inventions, innovations and improvements. TIA's objective is to support the state in stimulating and intensifying technological innovation with a view to improving economic growth and the quality of life of all South Africans by developing and exploiting technological innovations. The Agency's strategic programmes are aligned with the national, continental, and global imperatives.

The Science and Technology Laws Amendment Act (9 of 2020) came into effect on 1 April 2021. Several amendments were made to TIA Act (26 of 2008). A key change was that the Agency may perform any function in any territory beyond South Africa's borders. This change empowers the Agency to pursue international partnership opportunities more intentionally to achieve its objectives in fulfilment of its mandate.

PART B

STRATEGIC FOCUS

Vision

Be a leading technology innovation agency that stimulates and supports technological innovation to improve the quality of life for all South Africans.

Mission

Facilitate the translation of South Africa's knowledge resources into sustainable socio-economic opportunities.

Values

TEAMWORK

Together we can do more. Fostering teamwork creates a TIA work culture that values collaboration and co-operation.

PROFESSIONALISM

We apply the most appropriate skills, competencies, experience and knowledge of best practices.

EXCELLENCE

TIA will be accountable to all stakeholders to deliver exceptionally high standards of work and performance.

INTEGRITY

Everyone strives to do what they said they would: 'We keep our word.'

TRANSPARENCY

We engage in inclusive open communication and hold one another accountable for our performance and conduct.

INNOVATION

We foster a culture in which we continually nurture and implement new ideas from our staff and stakeholders that enhance the way we do things and deliver services.

TIA's role in the innovation ecosystem

TIA was established to promote the development and use – in the public interest – of discoveries, inventions, innovations, and improvements. The objective of the Agency is to support the state in stimulating and intensifying technological innovation to improve economic growth and the quality of life for all South Africans.

The Agency plays a critical role in supporting the realisation of the government's vision through funding and de-risking technological innovation and supporting the commercialisation of publicly funded IP, especially (but not limited to) bio-based technologies. The Agency also supports the process of knowledge use, the diffusion of existing technologies and grassroots innovators in vulnerable and marginalised communities, in this way contributing to the achievement of the SDGs.

TIA also provides SET and enterprise development support to SMMEs and co-operatives, particularly to those that are black-owned, black women-owned, youth-owned or located in underserved provinces. From a regional and international perspective, TIA plays a key facilitation role through its collaboration with research and innovation institutions across the continent and beyond through joint technology development programmes and more.

TIA remains committed to contributing to the realisation of the following four NDP outcomes:

- **Outcome 2:** A long and healthy life for all South Africans.
- **Outcome 4:** Decent employment through inclusive economic growth.
- **Outcome 5:** A skilled and capable workforce to support an inclusive growth path.
- **Outcome 10:** Protect and enhance our environmental assets and natural resources.

It is incumbent on TIA to contribute to the realisation of the DSI's Decadal Plan by:

- Revitalising and modernising key sectors of the economy through improving economic competitiveness and productivity – specifically in the agriculture, manufacturing, and mining sectors.
- Leveraging off the circular economy and the digital economy as new sources of growth.
- Promoting innovation in support of health, specifically by optimising health systems, improving the quality of healthcare and digitising healthcare systems.
- Supporting energy-sector innovation in support of decarbonising the economy.

TIA seeks to pursue the following priorities through STI-focused interventions:

- Accelerating the rate of commercialisation of investments in the high-technology sectors that will help to rebuild South Africa's economic competitiveness, and in this way supporting economic recovery.
- Alleviating poverty, inequality, and unemployment by providing SET and enterprise development support to SMMEs in particular.
- Promoting transformation and inclusion, focusing particularly on the historically disadvantaged and marginalised (women, youths and persons with disabilities) as a response to communities in distress.
- Improving service delivery to citizens through investments in technologies such as Information and Communication Technologies (ICT)-based solutions for education, health and other social services.
- Fostering a broader enabling innovation environment, including expanding TIA's spatial footprint through technology and innovation support centres and Technology Stations.
- Stimulating bio-entrepreneurship through interventions which include providing access to expertise and high-end infrastructure.
- Supporting transformed recipients and investees in underserved provinces, and in so doing spreading the benefits of innovation more widely and directing developmental efforts to underserved parts of the country.

8. Ministerial Institutional Review

Implementation of the recommendations from TIA Ministerial Review will form an important part of the organisation's efforts in the current financial year. In designing its interventions for the year ahead, TIA has also considered other important Reviews undertaken in the past few years, inclusive of the National Treasury Spending Review, the Higher Education, Science, Technology and Innovation Institutional Landscape (HESTIIL) Review and the South African National Survey of Intellectual Property and Technology Transfer.

An important priority in this regard will be the finalisation of TIA's Corporate Strategy where the Board has approved a broad framework to rebuild TIA over a period of ten years, in three phases:

a. The **Consolidation Phase** to build on the Agency's current successes, whilst also allowing it to address gaps in the current organisational configuration and systemic challenges within the NSI. In this, TIA will pay particular attention to improving operational efficiencies around investment decisions turnaround time, organisational leadership, and commercialisation capabilities, amongst others.

b. The **Growth Phase** will commence in year three of the Towards TIA 2.0 process and intends to grow the scope of technology innovations and commercialisation so that TIA can have a greater impact on the social economic challenges it is a meant to address.

c. The **Scale Phase** will commence in year six of the journey and will aim to reach critical mass with TIA's expanding geographic footprint and massively addressing the effect on soci-economic impact nationally, regionally, and internationally. Scaling for TIA implies an increase in its capacity, impact, and reach, allowing it to support more innovations, reach a broader audience, and generate a more substantial impact on South Africa's technology ecosystem.

Therefore, much of the focus for the financial year 2024/25 will be on the Consolidation Phase, whilst laying the ground for the Growth and Scale Phases. TIA will develop the Corporate Strategy focusing on the following three dimensions:

- Institutional reform and reconfiguration, which will entail key actions to be undertaken to build TIA as a capable institution appropriately positioned in the NSI to execute its mandate effectively. The emphasis is on building the organisation towards TIA 2.0 with an appropriate strategy, business and operating model, and capabilities that will enable it to achieve higher levels of performance and impact in the system underpinned by strong institutional capacities and operational efficiencies.

- Systemic interventions to promote an enhanced and co-ordinated environment. These are framework conditions required to promote, enable and facilitate innovation and commercialisation. Key interventions under this focus area will include, amongst others, the establishment of a Venture Builder Programme to create a coherent framework for establishment of viable start-ups from funded innovations; an expanded Technology Stations Programme through partnership with technical and vocational education and training (TVET) colleges; measures to support the development of the black venture capital (VC) sector; launching the Small Business Innovation and Research (SBIR) Programme to promote public-sector innovation, and securing Section 54 standing exemptions from the PFMA as an initial step to increasing organisational flexibility and financial sustainability for TIA.

- Socio-economic impact interventions are those directed towards creating greater impact on the country's triple challenges arising from poor performance of the economy, de-industrialisation of key sectors and the need to exploit new sources of growth. Initiatives will include the launching of transformation programmes to increase the participation of women, youth and persons with disabilities in the economy. A second set of initiatives will focus on the implementation of high impact catalytic strategic innovation programmes, starting off with the two initiatives launched by the DSI on hydrogen and vaccine manufacturing. In this, TIA will establish a dedicated Programme to support South Africa's just energy transition and response to climate change, leveraging off of vast opportunities within the global green financing space.

9. Updated Situational Analysis

In developing the 2024/25 APP, TIA Board and management undertook a review of the external and internal environment to assess the factors that are likely to influence the organisation's ability to deliver on its strategy during 2024/25.

The most noteworthy development that will significantly affect operations and the impact the organisation seeks to make in the NSI are the cost-containment measures and budget cuts announced by the National Treasury, which are to be instituted across all government institutions. These budget cuts are due to a deteriorating fiscal situation, with economic growth having been suppressed and being less than optimal, prompting the drastic budget cuts.

Another noteworthy development has been the release of the report of the Ministerial Review of TIA. This report provides recommendations on important key areas that the organisation should focus on to ensure that it fulfils its mandate. The term 'TIA 2.0' has been coined as the project name for a recalibrated and optimally functioning TIA. The forthcoming financial year will ensure that the implementation of these recommendations is accelerated.

Despite the current challenging situation, TIA remains optimistic and focused on achieving its set targets for 2024/25. These challenges present the organisation with an opportunity to find solutions to pressing matters and accelerate measures for accessing funding from other sources that share similar objectives. Accessing these funds will be a way to drive projects that are of strategic importance to the organisation.

TIA's overall performance in the immediately preceding period was commendable and the organisation is now seeking to ensure that even under the current challenging circumstances, it continues to perform well.

An analysis of TIA's strengths, opportunities, aspirations and results is presented in Table 1.

Table 1: TIA strengths, opportunities, aspirations and results analysis

STRENGTHS
• The uniqueness of TIA's offerings and the extent of its mandate. • Solid foundation of key programmes, e.g. Technology Stations, Technology Platforms and Seed Fund. • Strong pipeline of near-market technologies for greater impact in the future (TRL7[1] and above). • Good baseline of strategic partnerships and strengthened relationships with key stakeholders. • A good collaborative relationship with the shareholder (DSI). • A track record of a sound governance and control environment. • Capable staff and robust information technology capabilities, with a demonstrable ability to function optimally. • TIA's attractive brand equity across selected stakeholder networks. • TIA's strong bio-economy focus. • A good track record of piloting programmes such as the Innovation for Inclusive Development programme and the Innovation Fund.

[1] *TRL = Technology Readiness Level.*

OPPORTUNITIES

- New policy thrusts in the MTSF and the White Paper on Science, Technology and Innovation emphasising transformation and inclusivity, in addition to a focus on economic revival.
- Improved funding in the biotechnology landscape.
- Ministerial Review recommendations give TIA an opportunity to establish a transformed organisation that has the required capabilities to fulfil its mandate.
- Increased transformation in TIA's portfolio with regard to historically disadvantaged HEIs and individuals, women, youths, and persons with a disability due to the introduction of TIA's B-BBEE Policy, Transformation Framework and thematically focused funding calls.
- Several of TIA's core sectors are aligned to national priority areas (e.g. ICT and Health) in relation to the 4IR, Artificial Intelligence (AI)-driven trends in digital health and telemedicine, etc.
- Increased focus on the Bio-economy Strategy will improve South Africa's strategic positioning.
- Increase in demand for innovation- or technology-based investments by industry, government, and the funding community, leading to possible new funds (e.g. Clinical Trials Fund), programmes (e.g. Indigenous Knowledge Systems (IKS) Platform) and partnerships.
- Contributing to the implementation of the DDM to aid transformation.
- Financial technology funding growth.
- The DSI and the Department of Higher Education and Training (DHET) now report to the same ministry, offering opportunities to leverage partnerships with sector education training authorities (SETAs) and other DHET training initiatives.
- Leveraging funds to complement TIA's investment budget.
- Exploring external income generation from core activities to reduce reliance on the fiscus.
- Opportunity to support provinces other than Gauteng, KwaZulu-Natal and the Western Cape which have previously been underfunded.
- Convening and participating in new and existing initiatives in response to climate change and just energy transitions.
- Opportunity to expand TIA's Technology Stations network, Technology Platforms and Technology Cluster initiatives.

ASPIRATIONS

- To maximise and demonstrate the impact of TIA's investments through strategic decision-making that will benefit society, the economy and the environment.
- To create an inclusive and transformed innovation ecosystem.
- To influence the national innovation agenda and decision-making in the NSI.
- To be a transformed, coherent learning organisation that strives towards excellence and efficiency.
- To maintain and continuously improve sound governance structures.
- To increase the conversion of publicly funded R&D outputs into commercialised innovations.
- To be entrusted with greater portions of public and private funding so as to make more of an impact on society and in the economy.

RESULTS

- A diverse, inclusive, and transformed innovation ecosystem.
- TIA's efforts contributing to national socio-economic development.
- TIA that is the nexus of information on the innovation ecosystem, providing research and analysis for informed decision-making.
- An indispensable, agile, responsive and relevant TIA.
- TIA playing a strong leadership role in the NSI.

An analysis of the external environment in which TIA operates is presented in Table 2.

Table 2: PESTEL analysis

Dimension	Opportunity/risk
Political	• Poor appreciation of the potential for innovation to address social, economic and environmental issues across government. • BRICS membership has the potential to unlock funding and collaboration. • Potential for closer co-operation with the departments in the economic sectors, the Investment, Employment, and Infrastructure Development Cluster, especially the DHET. • The war in Ukraine having a negative impact on some value chains, including fertilisers, which are important in agriculture. • Potential to address the co-ordination or fragmentation challenges of the NSI through greater co-operation with other government departments and the private sector and by implementing collaborative initiatives. • Uncertainty concerning the effects of possible coalition politics at a national level in the future. • Instability in the ruling African National Congress.
Economic	• Low gross domestic product (GDP) growth. • Worsening energy crisis negatively affecting the operations of all sectors of the economy and threatening the sustainability of many businesses. • High failure rates of start-ups and SMMEs. • The weak rand hampers imports but benefits exports, having mixed effects on the economy. • A constrained public fiscus (lower tax collections from reduced economic activity) has resulted in below-inflation budget allocations and budget cuts. • Deteriorating infrastructure constraining economic activity and greenfields investment. • Escalating energy costs together with uncertain electricity availability.
Social	• High and worsening unemployment among black people, youths, and women particularly. • Increased civil unrest, service-delivery protests and annual #FeesMustFall campaign at universities. • Poor and deteriorating service delivery, particularly at the local municipal level. • Widening inequality and increasing poverty. • Imperative to harness innovation to address transformation and inclusion. • High likelihood of pandemics in the future.
Technological	• Increasing digitalisation of the economy and the rise of AI. • Increased drive to use renewable energy sources to temper the worsening electricity crisis. • Declining expenditure on experimental development while expenditure on basic and applied research continues to increase. • Declining gross expenditure on research and development (GERD) and business expenditure on R&D in real (inflation-adjusted) and nominal terms. • Low proportion of local inventors compared to other nations. • Rapid technological change and associated disruption to the economy and society. • South Africa's research enterprise is well balanced, with pockets of world-class science and technology capabilities (e.g. health). • The NSI's response to the COVID-19 pandemic demonstrated the importance of a strong, co-ordinated, and well-resourced STI system.
Environmental	• Accelerating climate change and associated extreme weather events. • Increased drive to use renewable energy sources as means to temper worsening electricity crisis and to reduce greenhouse gas emissions to meet CO_2 emission targets. • Increasing environmental degradation and species extinction. • Potential to leverage South Africa's rich biodiversity.
Legal	• Compliance with relevant legislative prescripts, including enabling legislation. • Potential for the state to adopt stronger capital controls and increased taxation, potentially rendering the economy less competitive and hindering growth.

10. External Environment Analysis

10.1. Global issues

An analysis of global issues[2] reveal the following.

1. Future pandemic preparation and response

COVID-19 taught the world the importance of preparedness. The World Health Organization outlined the lessons the world should take to heart, including that science must guide policy. The politicisation of the pandemic led to a great amount of unnecessary damage. Another lesson is that science must pair with equity or else it can worsen inequalities. This is obvious when looking at how low-income countries struggled to get the vaccines while wealthier countries stocked up. More resilient healthcare systems are also a must, as well as more coherent global plans on how to respond. The world must also invest in research on contagious diseases, zoonotic diseases, the effectiveness of outbreak responses, and more.

2. Poverty reduction and the SDGs

The global COVID-19 pandemic caused significant setbacks in global efforts to eradicate poverty, reduce inequalities and create a more prosperous and healthier planet. Across the world, millions have lost their jobs and have slid back into poverty, childhood education has been interrupted, inequality has worsened, and essential health services have been severely disrupted. The SDGs provide a framework for greater focused collective action on a global and local scale to improve people's lives and preserve the planet's ecosystems.

3. Wildlife and the environment

According to the World Wide Fund for Nature and the Zoological Society of London, there has been a 69% decline in vertebrate animal populations worldwide since 1970. Causes of the decline include habitat loss and over-exploitation through hunting, fishing, and poaching. The highest losses have been observed in the oceans, where freshwater fish and populations of sharks and rays have experienced average declines of 83% and 71% respectively.

Since 1900, approximately 600 trees, flowers and fruit-bearing plants have become extinct across the globe. This took place at a rate of about three species a year, which is around 500 times higher than the background (natural) extinction rate. The United Nations Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services predicts that more than one million of all species are currently threatened with extinction.

The bulk of threatened species are insects, e.g. dragonflies, bees, butterflies, and beetles, which are crucial to maintaining healthy ecosystems, particularly concerning ecosystem services such as pollination and nutrient recycling.

The critical ecosystem services provided by nature are fundamental to our survival and sustenance. These include the provision of the water we drink and the air we breathe, as well as the soil that nourishes our food. The forests and oceans are not only essential for regulating the Earth's temperature but also play a significant role in absorbing greenhouse gases and other pollutants.

However, the bio-diversity and ecosystem functions and services provided by nature and also its essential contributions to people are under pressure from the irresponsible disposal of waste and our unsustainable use of natural resources.

4. Climate change

The 2015 Paris Agreement seeks to limit global temperature rise to 1,5°C above pre-industrial levels. While some progress has been made towards this goal, it is generally acknowledged that global commitments to arrest climate change are inadequate and that there is insufficient urgency to prevent the impending crisis. This as the world witnesses more frequent extreme weather events and accelerating bio-diversity loss. In the future, climate change will create other dangers to human health such as major health problems, premature deaths and risks to cities and settlements.

Indeed, breaching the 1,5°C level would cause 'unavoidable increases in multiple climate hazards' plus 'multiple risks to ecosystems and humans', according to the Intergovernmental Panel on Climate Change's 2022 report. Greater attention is needed on measures to mitigate and adapt to climate change. Furthermore, those countries most threatened by climate change need to be supported. The catastrophic destruction of the planet's forests, plants, animals, and ecosystems must be prevented.

5. Food insecurity

Acute food insecurity is rising dramatically. The causes include economic shocks which underpin increases in global food prices, weather-related disasters, and increased demand due to continued global population growth. In addition, domestic food price inflation in low-income countries also rose considerably. Close to 193 million people were experiencing acute food insecurity in 2021, which is an increase of almost 40 million since 2020. This represents a staggering 80% increase since 2016.

[2]*Source: United Nations, World Economic Forum, International Monetary Fund.*

6. Gender equality and the rights of girls and women

Pervasive and systemic challenges are preventing the world from closing the gender rights and opportunity gaps for girls and women. The COVID-19 pandemic has also had a disproportionate impact on girls and women, setting back the hard-won progress made in the past. Initiatives are needed to advance economic justice and gender equality and to act decisively on gender-based violence.

7. Growing humanitarian crises and conflicts

The world has in recent times faced unprecedented levels of humanitarian need due to rises in forced displacement, famine, drought, vaccine inequity, authoritarianism, conflict, and violence in addition to overlaps between problems related to climate, hunger, and conflict. The crises and conflicts are most often cross-border in nature, requiring global co-operation.

The war in Ukraine has precipitated what is the fastest-growing refugee crisis since the Second World War. Such crises endanger already marginalised groups and put women and children at a higher risk of trafficking, violence, and death.

8. Cybersecurity

Cybersecurity vulnerabilities are on the rise due to rapid digitalisation of societies and industries. This was accelerated in part by the COVID-19 pandemic and the need for employees to work from home together with entrepreneurs needing to pivot to take advantage of or create opportunities in the digital economy. The risk of cyberattacks is accordingly higher than before, with malware and ransomware attacks rising dramatically.

10.2. Emerging technology and innovation challenges faced by developing countries

It is broadly acknowledged that human development and economic growth are associated with rapid changes in technology. According to the United Nations Conference on Trade and Development (UNCTAD), the rate of change is likely to increase due to the proliferation of frontier technologies. Rapid advances in these technologies have greatly benefited society but they can also have significant negative consequences such as job losses through automation, the divisiveness caused by interactions on social media platforms, and widening already existing inequalities.

Frontier technologies are defined as those which combine digitalisation and connectivity, potentially combining and multiplying their impacts to boost productivity and improve livelihoods. Examples include AI, the Internet of Things (IoT), big data, blockchain, 5G, 3D printing (also known as 'additive manufacturing'), robotics, drones, gene editing, nanotechnology, and solar photovoltaic and green hydrogen.

UNCTAD contends that whereas frontier technologies are created and developed in specific countries, all countries need to prepare for them. The organisation has created a readiness index for countries to assess their national capabilities to use, adopt and adapt these technologies equitably. South Africa's readiness index (and sub-index rankings) compared to that of selected countries is presented in Table 3.

Table 3: Selected countries' readiness to use, adopt and adapt frontier technologies equitably

Country name	Total ranking		ICT ranking		Skills ranking		R&D ranking		Industry ranking		Finance ranking	
	2021	2023	2021	2023	2021	2023	2021	2023	2021	2023	2021	2023
USA	1	1	14	11	17	18	2	2	20	16	2	2
Sweden	2	2	1	6	7	2	16	16	15	11	16	18
Germany	9	7	23	24	16	17	5	5	10	12	39	40
China	25	35	99	117	96	92	1	1	7	8	6	4
Russian Federation	27	43	39	32	28	32	11	13	66	54	45	69
Brazil	41	40	73	50	53	55	17	18	42	51	60	57
India	43	46	93	95	108	109	4	4	28	22	76	75
South Africa	54	56	69	71	84	77	39	36	71	67	13	25
Mexico	57	61	68	70	83	73	29	45	33	31	96	96
Mauritius	77	73	83	96	58	57	94	82	74	74	40	34
Egypt	87	83	117	91	67	66	42	47	100	90	116	119
Kenya	105	117	108	120	123	135	78	83	89	93	108	107
Nigeria	124	119	124	119	106	108	74	68	155	157	149	153

Number of countries: 158; Source: UNCTAD Technology and Innovation Report 2021 and 2023

South Africa ranks the lowest in its ability to use, adopt and adapt frontier technologies in the BRICS grouping of countries, but is ranked the highest out of sub-Saharan African countries in the 2021 and 2023 periods. The country scores high in its finance and R&D ranking relative to its overall ranking, but low in ICT, skills, and industry rankings. South Africa further declined by two places in 2023 compared to its performance in the 2021 world rankings.

Frontier technologies already represent a USD1,5 trillion market,[3] which could grow to more than USD9,5 trillion by 2030 – about three times the current size of the Indian economy. But so far, developed economies are seizing most of the opportunities, leaving developing economies further behind.

The total exports of green technologies from developed countries jumped from around USD60 billion in 2018 to more than USD156 billion in 2021. During the same period, exports from developing nations rose from a similar starting line of USD57 billion to only about USD75 billion. Figure 1 projects the growth in the market size of frontier technologies.

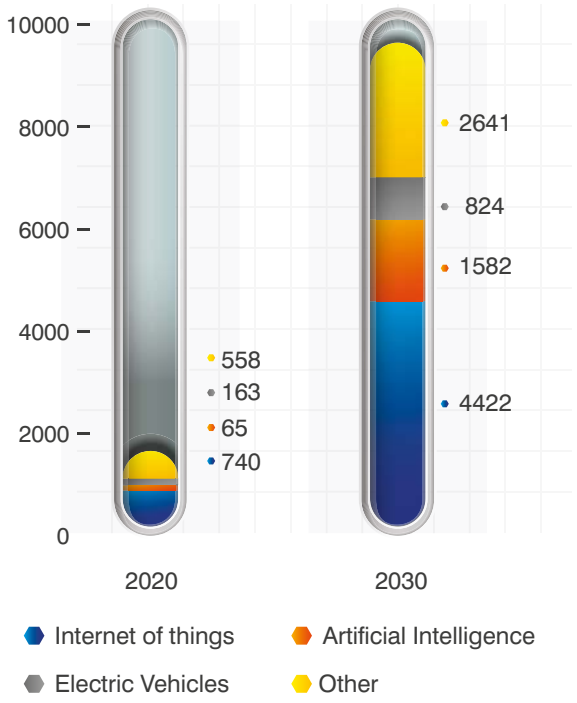

Figure 1: Market size estimates of frontier technologies, billion USD

Source: UNCTAD Technology and Innovation Report 2023

[3] *UNCTAD Technology and Innovation Report 2023.*

The digital nature of these frontier technologies is mirrored by Gartner in its annual emerging technologies hype cycle analysis. Gartner identifies technologies that are anticipated to affect business and society over the next two to 10 years, but particularly those that will support digital business transformation. In the 2022 hype cycle analysis emerging technologies on the so-called 'peak of inflated expectations' include computational storage, Web3 (a new conception of the World Wide Web that incorporates decentralisation, blockchain technologies and token-based economics), foundational models (large AI models trained using large quantities of unlabelled data), decentralised identity, non-fungible tokens and cloud data ecosystems. Interestingly, Gartner does not identify any technologies in the 'trough of disillusionment', unlike in the past, suggesting that there are not many emerging technologies which were once over-hyped but have not yet come to fruition. Almost all the emerging technologies which reside on the 'innovation trigger' side of the hype cycle are digital in nature.

The hype cycle has changed visibly since 2022: the 2023 hype cycle shows that AI-augmented, Generative AI and Cloud native, Software engineering, and API-centric Software as a Service (SaaS) are at the peak of inflated expectations. An API-centric application is a web service that is built using application programming interfaces (APIs) to exchange data with other applications; it allows the front end and the back end to communicate. These technologies are at the peak of inflated expectations – some variations did not even feature under the innovation trigger cycle in 2022. This is indicative of a fast-paced industry. Figure 2 presents these emerging technologies in 2023. This year there are still no technologies that have fallen into the trough of disillusionment which depicts that they performed below expectations.

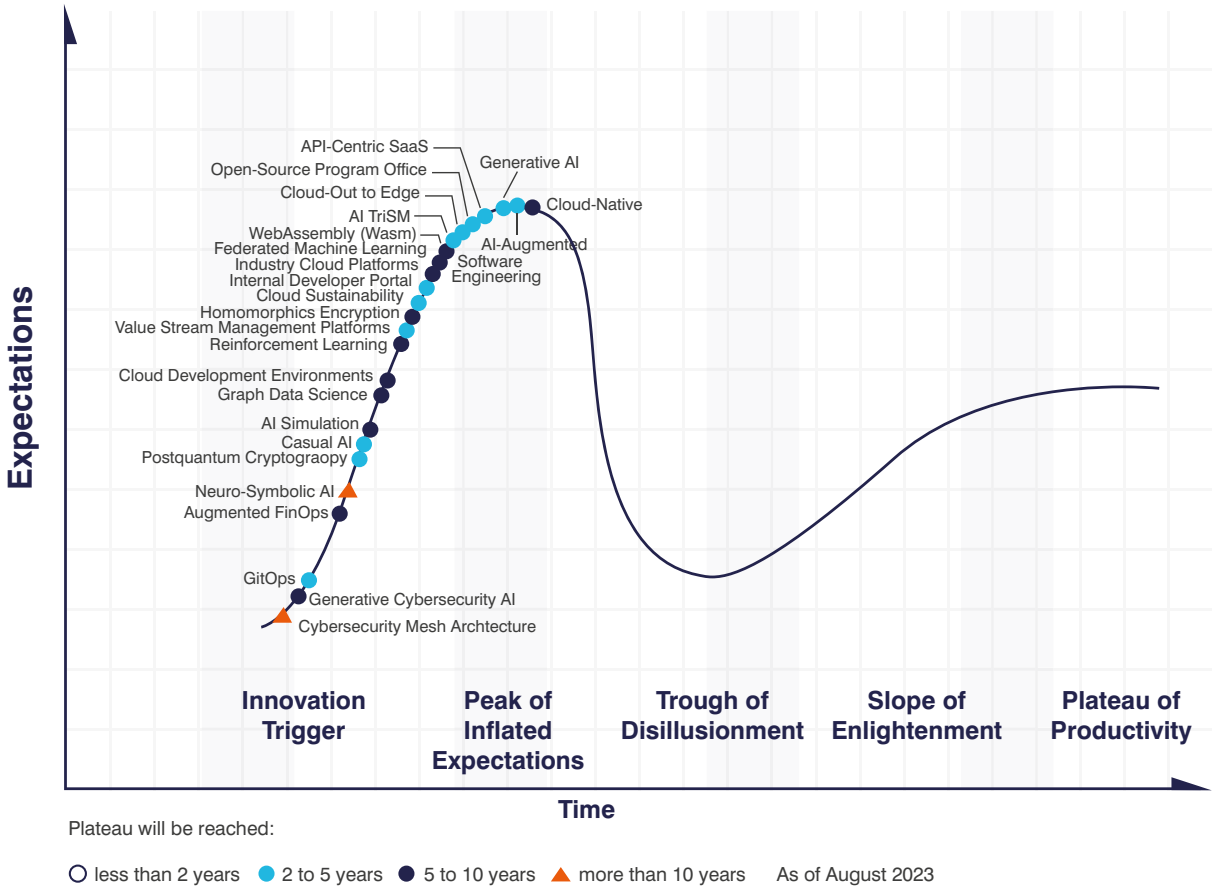

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Figure 2: Gartner's hype cycle for emerging technologies in 2023

Three high-growth technologies that have been identified as such in government documents and are the key building blocks to the government's push towards the 4IR are digitalisation, biotechnology, and nanotechnology. Digitalisation entails using digital technologies to change a business model and the process of moving to a digital business. AI is a driving force behind digital transformation, encompassing as it does innovations such as machine learning, 3D printing, IoT, data-labelling platforms and predictive analytics. Figure 2 shows the trends in patenting for the three emerging areas. Biotechnology has performed better than both nanotechnology and digitalisation in its inventiveness because it has produced the highest number of patents over a ten-year period. It is then followed by nanotechnology, which experienced a slump in 2017/18 and was able to recover to some extent in 2020/21. Digitalisation has the produced the least number of patents, although in 2017/18 it fared better than nanotechnology.

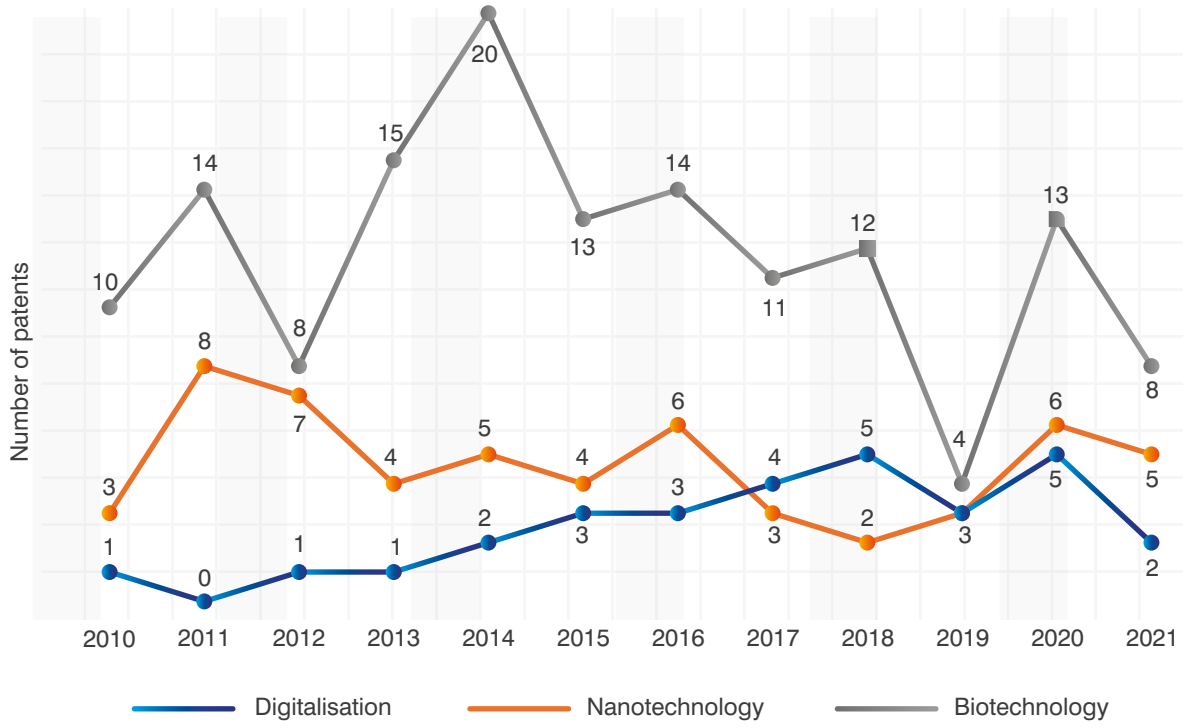


Figure 3: Trends in patenting for three emerging areas

Source: NACI STI Indicators Report 2023

10.3. South African research and innovation landscape

TIA's mandate compels it to harness knowledge resources that are generated in the research, development, and innovation (RDI) system. It is therefore important that this system is productive and generates research outputs in fields that are directly relevant to South Africa's socio-economic development objectives. The assessment of this system is important as this enables mitigation mechanisms to be put in place in areas of poor performance. The RDI system is an important input and feeder to TIA's pipeline of investible projects. This section outlines the status of South Africa's RDI systems: scientific and technological system; innovativeness; R&D expenditure.

Scientific and technological system

South Africa has maintained a strong annual growth in scientific articles published in peer-reviewed journals, recording 3 693 published journals in 2000 and 27 052 in 2021. The number of publications per million population rose from 248 in 2011 to 505 in 2020.[4] However, it is broadly acknowledged that the rate of use of scientific outputs for socio-economic benefit is not at the desired level. This is particularly true in the case of commercialising the outputs of publicly funded R&D, but also extends to incremental innovation and the harnessing of existing knowledge and technologies to enable inclusive growth and development. Access to new and existing knowledge and technologies remains unbalanced with regard to spatial distribution for innovators.

[4] *NACI STI Indicators Report 2022 and 2023.*

After a period of growth in the total number of researchers, there has been a downward trend from 36 233 in 2017/18 to 34 072 in 2021/22. Between 2011/12 and 2017/18, the number of researchers in South Africa increased at a faster rate than the total employment in the country. Most researchers are based in the higher-education sector (86,3% in 2020/21). The business sector's share of total researchers in the country decreased from 15,2% in 2011/12 to 7,3% in 2020/21.

The generation, advancement, dissemination, and application of scientific and technical knowledge in all fields of S&T are collectively termed 'scientific and technological activities' (STAs). There are three categories of STA according to international guidelines, namely, R&D,[5] scientific and technical education and training (STET[6]), and scientific and technological services (STS[7]).

Table 4 shows South Africa's historical STA budget and proportional share between the three STA categories. In 2020/21 the STA budget was R30,1 billion. While the STA budget has increased over the past few years in nominal terms, in inflation-adjusted terms there has been a decline. There was an increase of 6,95% from 2019/20 nominal terms, but there was a decline of 5,14% in 2010 constant prices. In addition, the STS share is increasing, whereas R&D and STET are declining.

Table 4: Quantum and proportion of STAs in South Africa (2016/17–2020/21)

Year	STA budget (R billion)	R&D (% share)	STET (% share)	STS (% share)
2016/17	23,4	57,5	17,8	24,7
2017/18	20,2	56,9	17,8	25,3
2018/19	26,0	53,5	16,9	29,6
2019/20	28,6	55,4	15,8	28,8
2020/21	30,1	55,3	15,6	29,1

Source: NACI STI Indicators Report 2023

Innovativeness

According to the 2022 Global Innovation Index, in innovativeness South Africa ranks 14th among the 36 upper-middle-income group economies and ranks 2nd among the 27 economies in sub-Saharan Africa. Five input pillars capture elements of the national economy that enable innovative activities. These inputs are captured in interventions that are made in institutions, human capital and research, infrastructure, market sophistication and business sophistication. Innovation outputs are the results of innovative activities in the economy and include two output pillars: knowledge and technology outputs, and creative outputs.

South Africa performs better in innovation outputs than innovation inputs. It produces more innovation outputs relative to its level of innovation investments. In 2022, the country ranked 69th out of 132 countries in innovation inputs, lower than those in both 2021 and 2020. As for innovation outputs, South Africa ranks 61st. This position is higher than those in both 2021 and 2020.

In contrast to the increase in scientific publications, patent applications – one of the proxy indicators of inventiveness – have trended downwards in recent years: patents granted to South African residents have been on a downward trend over the decade. Overall, the number of patent applications per million population declined from 34 in 2011 to 25 in 2019. This figure is low compared to the average of 641 for upper middle-income countries in 2019.

The proportion of patents granted to local inventors by the Companies and Intellectual Property Commission ranges between 9% and 12,1% of total patents awarded for the period 2008–2021. This is in stark contrast to most patents being awarded to local inventors internationally (with some exceptions). There has also been a steady decline in the number of South African patents granted at the European Patent office. In 2021, the number of South African patents granted at the European Patent office declined by 18,6%. In the same year, the sale of South African IP increased compared to the previous year, but South Africa's share of receipts has significantly and consistently declined compared to all middle-income countries, dropping from 3,3% in 2016 to 0,8% in 2021 – reflecting a slowdown in investment and economic growth.

[5] R&D (also called research and experimental development) is defined as 'creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications' (Source: South African National Survey of Research and Experimental Development Statistical Report 2019/20).

[6] STET 'includes all activities related to specialised non-university higher education and training; higher education and training leading to a university degree; post-graduate and further training and organised life-long training, for scientists and engineers' (Source: Eurostat).

[7] STS are defined as 'activities concerned with [R&D] and contributing to the generation, dissemination and application of … S&T' (Source: Eurostat).

Another proxy indicator measuring inventiveness are trademarks. These are marks or brand assets that are capable of registration in terms of trademark legislation and are used to register goods or services. The focus of trademarks filed by institutions in South Africa shows a significant fluctuation in the number of new trademark filings: at 85, 2015 had the highest number of trademark filings; by 2018, the number had declined to 56. Trademark applications can be filed in different countries at different times. Trademarks are therefore often filed not by an institution but rather by the commercialisation partner, and only once commercial readiness is reached.

Research and development expenditure

Gross expenditure on R&D (GERD) as a percentage of GDP declined from 0,76% in 2017/18 to 0,61% in 2020/21. There were large disparities in provincial R&D expenditure, with Gauteng contributing the highest (44%), followed by the Western Cape (25%).

Business expenditure on R&D has been on a consistently declining trend over the past decade, with a further decline in 2020/21 (10,8%). In recent years, the business sector has also experienced a decline in its capacity to attract foreign funding for R&D in the business sector. This decrease reached 20% decline during the 2020/21 financial year.

While a decline in overall R&D expenditure is of concern to the NSI, the continued decline in experimental development as a proportion of total research expenditure is of concern to TIA specifically. Table 5 shows that expenditure on experimental development declined precipitously from 36,3% in 2011/12 to 23% in 2020/21. This was from a high of approximately 46% in 2006/07. Experimental development entails the systematic process of using existing and new knowledge to produce new or improved products or processes and it accounts for the bulk of GERD in leading countries. Given that experimental development enables product and process innovation that is crucial to economic growth, enterprise creation and employment, TIA maintains that South Africa needs to invest more in it.

Table 5: Expenditure by type of research in South Africa (2011/12–2019/20)

Year	GERD R'000	Basic research R'000 (%)	Applied research R'000 (%)	Experimental development R'000 (%)
2011/12	22 209 192	5 439 561 (24,5)	9 388 273 (42,3)	7 381 358 (33,2)
2012/13	23 871 219	6 030 827 (25,3)	11 064 247 (46,3)	6 776 146 (28,4)
2013/14	25 660 573	6 102 085 (23,8)	12 132 211 (47,3)	7 426 277 (28,9)
2014/15	29 344 977	7 133 213 (24,3)	14 331 016 (48,8)	7 880 748 (26,9)
2015/16	32 336 679	8 209 662 (25,4)	15 349 070 (47,5)	8 777 948 (27,1)
2016/17	35 692 973	9 542 644 (26,7)	17 061 167 (47,8)	9 089 162 (25,5)
2017/18	38 724 590	10 223 956 (26,4)	20 623 856 (53,3)	7 876 778 (20,3)
2018/19	36 783 968	10 364 091 (28,2)	19 316 433 (52,5)	7 103 444 (19,3)
2019/20	34 484 862	11 043 171 (32,0)	16 074 948 (46,6)	7 366 744 (21,4)
2020/21	33 541 332	9 856 349 (29,0)	15 848 231 (15,0)	7 836 752 (23,0)

Source: South African National Survey of Research and Experimental Development Statistical Report 2020/21

10.4. South African entrepreneurship and start-up ecosystem

The Global Entrepreneurship Monitor measures the state and quality of country entrepreneurial ecosystems in a composite indicator dubbed the National Entrepreneurship Context Index. South Africa ranked 45th out of the 50 countries measured in 2022 and has the lowest score of the BRICS countries. The conclusion made in the report is that South Africa does not sufficiently support entrepreneurship and that the country's entrepreneurial ecosystem does not show signs of improvement.

On the VC front, while investment activity by value of deals decreased to R1,31 billion in 2021 from R1,39 billion in 2020, the number of deals increased by 11,4%.[8] Venture capital is defined as financing that investors provide in the start-up and early growth phases to enterprises that are believed to have high potential for growth in the long term. In 2021, ICT, consumer products and services and business products and services were the three leading sectors, accounting for 69,2% by value of all VC investments. Ranked by number of deals, ICT, business products and services and consumer products and services were the three top sectors, largely mirroring deals by value, accounting for 71,3% all VC deals. By value, VC deals take place predominantly in the Western Cape (51,3%) and Gauteng (35,8%).

[8] *Southern African Venture Capital Association (SAVCA) 2022 Venture Capital Industry Survey; STI Indicators Report 2023.*

A report on the 'tech' start-up ecosystem by Disrupt Africa[9] underscores the importance of more venture capital to be made available in South Africa, particularly from institutional investors. The authors maintain there is a misconception locally that the risks in VC are too high, but stress that in mature financial markets the VC asset class is regarded as an essential part of a diversified institutional portfolio, whether a pension funds or university endowment fund.

The survey of 490 'tech' companies (or digitally enabled start-ups) mirrors the SAVCA data, with the Western Cape accounting for 51,2% of ventures tracked by the survey, with Gauteng accounting for 45,3%. Of the start-ups surveyed, fintech (30%) dominates, followed by e-commerce and retail-tech (10,2%), eHealth (9%) and ed-tech (8,6%). Within fintech, the payments and remittances category is the most populated (27,2%), followed by lending and financing (17%) and insuretech (16,3%). These companies employ a total of 11 349 individuals, with an average of 23 employees per start-up. The fintech sector is also the largest employer (38,7%), followed by ed-tech (12,2%) and e-commerce and retail-tech (6,3%).

In the South African 'tech' or digitally enabled start-ups space, since 2015 at least 357 start-ups have raised almost USD1 billion in total funding, with South Africa outdone in Africa only by Nigeria. Of this, the fintech sector has raised the most in funding. Since 2015, 35 South African tech start-ups have been acquired – the most of any African country.

Regarding tech start-up support, the report concludes that there are approximately 340 hubs and co-working spaces across the country, predominantly in Cape Town and Johannesburg. Most incubators and accelerators that provide support to tech start-ups are also based in these two cities. The private sector supports start-ups and SMMEs in numerous ways. For example, 50 of South Africa's largest corporates and the Public Investment Corporation are shareholders in the SA SME Fund, a private sector-led initiative that aims to stimulate the economy and create jobs. Likewise, universities provide various forms of support, some through their Offices of Technology Transfer. Government support for start-ups and SMMEs is provided by the following organisations:

- Department of Small Business Development: Small Enterprise Development Agency, Black Business Supplier Development Programme, Youth Challenge Fund, Township and Rural Entrepreneurship Programme, and Small Enterprise Finance Agency.
- TIA: Seed Fund, Technology Development Fund, Commercialisation Support Fund.
- Department of Trade, Industry and Competition: Support Programme for Industrial Innovation, Technology and Human Resources for Industry Programme.
- Industrial Development Corporation (IDC): Funds entrepreneurs with industrial development.
- National Treasury: Jobs Fund.
- Various provincial initiatives, for example: Gauteng Provincial Government (The Innovation Hub, Gauteng Enterprise Propeller) and Western Cape Provincial Government (Design Innovation Seed Fund).

This report highlights several key challenges facing the VC landscape in South Africa, which apply across the board, not just to digitally enabled or tech start-ups:

- High-potential start-ups need an accelerated improvement in quality to place them on a path to growth in order to upscale quickly and become sustainable and fundable. Of the 490 tech ventures tracked, only 25,7% have undergone some form of acceleration or incubation compared to 38,6% of Egyptian ventures.
- More capital is needed for seed funding for very early-stage start-ups, which would enable more throughput of start-ups and serve to build a sustainable pipeline of investible deals by more mature VCs.
- An appropriate regulatory framework is needed to enable the sector to thrive. This will entail simplifying the regulations affecting start-ups and removing the bureaucratic constraints to their growth, but also the introduction of suitable regulations that support and incentivise early-stage businesses.
- The translation of locally-developed IP into commercialised entities must be improved by deploying appropriate levels of risk capital when taking associated technologies to market.

10.5. Local and international policy environment

The NDP 2030 is a long-term vision for the country. It provides the programme through which South Africa can achieve economic transformation through development with the aim of eliminating poverty and reducing inequality by 2030. The NDP states that the country's competitiveness will be determined by the nature and extent of the vibrant national systems of innovation that will be in place, together with innovation and learning permeating business and society.

[9] *The South African Start-up Ecosystem Report 2022.*

The 2020/21–2024/25 MTSF outlines government's strategic intent to implement the ruling party's electoral mandate and NDP Vision 2030 to redress the triple challenges of unemployment, inequality and poverty.

The NDP review is a process that was embarked upon to determine progress in achieving Vision 2030 as set out in the NDP. For the period under review (2012–2019), the economy remained in a low-growth trap, with GDP growing by 1,3% a year. This was well below the NDP target of growing the economy at 5,4% on average per annum by 2030. The NDP also set targets for reducing unemployment from 25,4% in 2010, to 20% by 2015, 14% by 2020 and 6% by 2030. The path to achieving the 2015 goal would have entailed the creation of 2,2 million jobs between 2010 and 2015, or 436 000 annually. This would have relied on an average GDP growth rate of about 4,6% per annum. In the 2008 to 2017 period, the average annual job creation was 141 000, which is only 30% of what was needed. In 2023 the unemployment rate stands at about 32,6%.

Employment continues to have a gendered and generational distribution. Women have far lower employment prospects than men: about 37% of women of working age are in employment compared to 50% of men. Youth (15–24 years) unemployment is persistently much higher than all the older age groups and has been consistently at about 50%.

The challenges identified included that in the period following the adoption of the NDP, strong political will and leadership to rally society and social partners to implementing the Plan was absent. This lack of inspiration and implementation has left the country well short of its 2030 vision and targets. There is thus an urgent need for course correction to get the increases in employment back on track as envisaged in the NDP to 2030. This will entail crafting an implementation strategy in future that will focus on dealing with the most pressing issues. Among these issues are:

- Fixing the state and its agencies to restore governance and service delivery.
- Being decisive in professionalising the public service and stabilising management and leadership in state institutions.
- Pursuing fiscal sustainability.
- Eliminating corruption.

The leadership of the current sixth administration in government has embarked upon redressing these and related problems. This should provide a good basis from which to reinvigorate the implementation of the NDP urgently and decisively with strategic coherence, a process in which roles and responsibilities in the state institutions and among social partners are clearly articulated and accountability is enhanced.

The Economic Reconstruction and Recovery Plan of October 2020 aims to restore South Africa's economy by stimulating equitable and inclusive growth following the impact of the COVID-19 pandemic. The objectives of the plan are to create jobs through infrastructure investment and mass employment programmes, re-industrialise the economy with a focus on small businesses, speed up economic reforms to unlock investment and growth, fight crime and corruption, and improve the state's capability.

The DDM aims to improve service delivery through better planning across the three spheres of government at the national, provincial and local government levels and by enabling partnerships at the district level between communities, private industry and labour. The overall objective is to improve development and service delivery at the municipal district and metropolitan levels.

The African Union's Agenda 2063 is a long-term people-centred strategic framework for the socio-economic transformation of Africa. Agenda 2063 calls for the sources of growth to be diversified to enhance Africa's economic performance and, in the long term, raise large sections of the continent's population out of poverty. The strategic framework also fosters social transformation, economic industrialisation, and entrepreneurship.

The United Nations SDGs aim to:

- End poverty and hunger globally.
- Combat inequality.
- Build peaceful, just and inclusive societies.
- Protect human rights.
- Promote gender equality and the empowerment of women and girls.
- Ensure the protection of the planet and its natural resources.

The objective is to create conditions for sustainable and inclusive economic growth, shared prosperity and decent work for all.

10.6. South African STI policy environment

STI play a pivotal role in contributing to equitable and inclusive economic growth and development, decent work, sustainable livelihoods, environmental protection and service delivery.

The Bio-economy Strategy provides a high-level framework with which to guide bioscience research and innovation investments and actions by stakeholders in the South African NSI. It seeks to use South Africa's bio-based resources to become a significant contributor to the country's economy by 2030 through the creation and growth of biotechnology-based industries.

The White Paper on Science, Technology and Innovation of 2019 lays out the policy direction for the government to ensure that STI enjoys a growing role in a more prosperous and inclusive society. It envisages STI increasing inclusive economic growth, promoting social development with an emphasis on transformation and supporting environmental sustainability. It also emphasises the need to improve policy coherence and more effective budget and programme co-ordination in response to persistent STI policy fragmentation across government institutions and with the private sector, publicly funded research organisations and civil society. The White Paper also emphasises the need to broaden monitoring and evaluation systems; create a more enabling environment for innovation; develop local innovation ecosystems; increase investment support to technology-based SMMEs and provide support to grassroots and social innovation, among other objectives.

The DSI's Cabinet-approved Decadal Plan is the implementation plan that ensues from the White Paper on Science, Technology and Innovation and gives effect to the vision expressed in the White Paper for STI, 'enabling inclusive and sustainable South African development in a changing world'. In particular, innovation holds great potential for economic growth, employment creation, the improvement of livelihoods and enhancing government performance and service delivery. The interventions of the Decadal Plan seek to position STI, and innovation specifically, as central to sustainable socio-economic growth and development to redress poverty, inequality, and unemployment, and ensure environmental protection.

10.7. Institutional approach to the Decadal Plan

The Decadal Plan 2021–- 2031 was approved by Cabinet in November 2021 to serve as the implementation plan on the White Paper of STI for the next ten years. It articulates three societal grand challenges on climate change and environmental sustainability; future-proofing education and skills; and the future of society. It also defines six STI priorities that focus on:

- Revitalising and modernising sectors of the economy in agriculture, manufacturing and mining.
- Exploiting new sources of growth in circular economy and the digital economy.
- Innovation in support of health.
- Innovation in support of the energy sector.
- Innovation in support of a capable state.
- Innovation for inclusive development.

For TIA, the approval of the Decadal Plan represents an important final step in the setting out of a firm and clear policy direction with respect to the key imperatives to be pursued through STI where TIA has an important contribution to make.

This requires that the Agency positions itself as a leader in innovation and innovation enablement, playing an effective curatorship and thought leadership role, building on its existing portfolio of investments, instruments and interventions in a more concerted and refocused manner.

TIA's approach to implementation of the Decadal Plan in the current financial year, will be premised on several aspect of the Plan. These include:

- Dedicating greater focus on investment in high-tech industries aligned to the revitalisation agenda and new sources of growth in the prioritised sectors.
- Implementation of multi-stakeholder, catalytic strategic innovation programmes that will bring about greater socio-economic impacts arising from the establishment of new industries such as hydrogen, vaccine manufacturing, renewable energies, cannabis, etc.
- Implementing specific initiatives and programmes to promote transformation and inclusivity of the NSI with the focus on designated groups, grassroots innovators and dedicated interventions to expand the spatial footprint for innovation in line with the objectives and principles of the DDM.
- Promoting partnerships with public sector institutions such as government departments, at national and provincial level, including their agencies and state-owned entities with a view to promoting public spending on innovation and addressing service delivery challenges.
- Contribute to the building of an effective innovation enabling environment through interventions in innovation and entrepreneurship skills, innovation infrastructure promoting linkages and networks, and coherence within the innovation ecosystem.
- Leveraging funding partnerships with industry, whilst promoting funding efficiencies within the NSI through a Glass Pipeline partnerships model to address the challenges of duplication, fragmentation, and lack of effective co-ordination.
- A refocused international partnerships strategy that prioritises leveraging of BRICS relationships, the Africa Agenda, and international resource mobilisation through collaboration with countries in the North, multilateral institutions, and various philanthropic organisations.
- A realigned and well-capacitated organisation with key capabilities in core business of innovation and commercialisation with optimal operational efficiencies.

11. Internal Environment Analysis

11.1. Organisational performance

In 2022/23 TIA recorded a year-end output performance achievement of 94%, representing a total of 17 targets achieved out of 18 output indicator targets for the year. This is a favourable achievement compared to the Agency's performance of 86% in 2021/22. This performance has been achieved in an environment with many challenges, including a period during which there was a worsening of the energy crisis which constrained the activities of many businesses that benefit the economy. TIA's performance against its output targets over the last seven years is presented in Figure 4.

Figure 4: TIA's performance over the past seven years

TIA met or achieved an acceptable level of performance against all its output indicators in 2022/23 except for investment decision turnaround time for funding applications (<R1 million category). The Agency over-achieved significantly against targets for joint collaborations between academia and industry, technologies diffused for inclusive development, products launched, leveraged funds, bio-based technologies developed, high-level human capital development, innovation products produced, transformation initiatives in underserved provinces and the transformation of the Agency's investment portfolio.

There is underachievement against two organisational outcomes as contained in TIA's 2020–2025 Strategic Plan, as shown in Table 6. These are delivering on the Bio-economy Strategy and SMMEs supported through Technology Stations. In 2024/25 efforts will focus on ensuring that the Agency achieves an acceptable level of achievement for these outcomes.

Table 6: TIA's cumulative outcome performance for the period 2020/21–2022/23

Outcome	Outcome indicator	Baseline	Planned five-year target	2020/21 performance (target)	2021/22 performance (target)	2022/23 performance (target)	Cumulative achievement (target)
Commercialised Innovations	Technologies commercialised	77	175	26 (9)	49 (31)	61 (40)	136 (80)
Delivering on the Bio-economy Strategy	Successfully demonstrated bio-based technologies	–	75	37 (9)	36 (12)	37 (15)	110 (36)
	Bio-based entrepreneurs and orgs accessing SET services	–	600	165 (105)	45 (110)	67 (120)	277 (335)
SMMEs supported through Technology Stations	SMMEs accessing SET services	10 530	15 750	1 990 (2 390)	3 167 (3 150)	2 671 (3 250)	7 828 (8 790)

The following activities are planned towards enabling bio-based entrepreneurs and organisations accessing SET services to meet their targets.

The Industrial Biotechnology Unit will be issuing calls from its supported the DSI-contracted programmes, for an estimated ten SMMEs to be supported over a two-year period. TIA-funded Active Pharmaceutical Ingredient Cluster and Medical Devices and Diagnostics Innovation Cluster anticipate that 30–40 SMMEs per annum could be supported in this way. The IKS Unit estimates that about 30 entities will be targeted in during a two-year period. The Agriculture Unit will continue to provide technology access to farmers, at an estimated 60 famers in total over the next two years. These figures will ensure that the targets are achieved.

TIA Bioprocessing Platform (of the Technology Platforms Programme) and UVU Bio will be used to create synergies between their respective capabilities by jointly offering services. The African Medicines Innovations and Technology Development Platform (AMITD), and the BSA will be approached to capture data on clients that received services from a centre or entity supported by TIA. The Technology Platforms will contribute the balance towards this target.

To ensure that the targets of the SMMEs supported through the Technology Stations are met, the Agency's role as a service provider will be enhanced at the support infrastructure level of the Technology Stations and the Technology Platforms. SET solutions are to be provided for any technical challenges that SMMEs face. The 18 Technology Stations and eight Technology Platforms, which are mostly housed at universities, will enable small business to adopt new technologies that will be demonstrated through the Agency's cutting-edge research equipment.

11.2. Transformation

TIA is committed to transformation and inclusive innovation and therefore seeks to invest in a developmental fashion to support innovators who are women, youths and/or persons with disabilities, or enterprises owned by these groupings. Accordingly, the Agency has sub-targets for these three categories for the relevant outputs and output targets. For example, regarding the number of products launched in 2022/23, TIA had targets of 30% of these products to be launched by women (women entrepreneurs or women-owned businesses), 50% by youths and 10% by persons with disabilities.

In 2022/23 TIA achieved seven out of eight of its output sub-targets for women, as shown in Figure 5, an indication that the Agency is doing well in this regard. To benchmark this performance, one can look at South Africa's Quarterly Labour Force Survey for the second quarter of 2023. The survey reports that female labour force participation stood at 54,3%, but that women remain less likely to participate in the labour force compared to men. In addition, looking to the latest available R&D statistics (according to the National Advisory Council on Innovation's (NACI) STI Indicators Report for 2023), women comprise only 46,2% of the total researcher head count. Women are also more likely to be unemployed than men. TIA's sub-targets for women range between 20% and 45%. In the context of the high unemployment rate for women and the lower propensity of women to participate in the economy, these targets are modest.

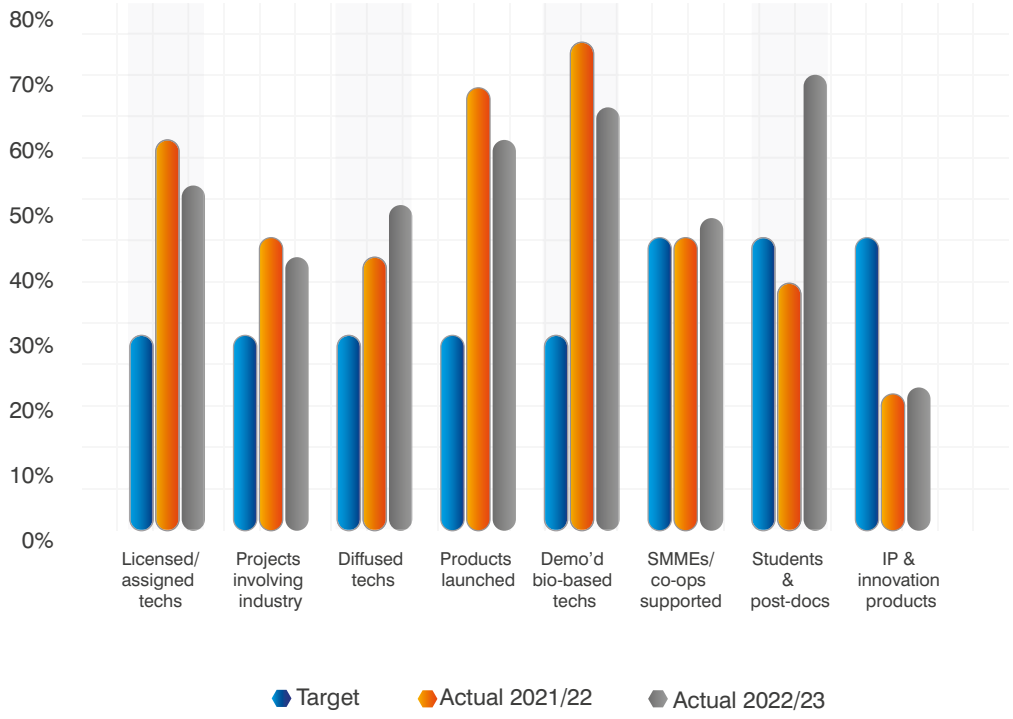


Figure 5: TIA's performance against output sub-targets for women in 2021/22 and 2022/23

For youths, TIA achieved six out of its eight output sub-targets in 2022/23, as shown in Figure 6. This again indicates that the Agency is doing fairly well in its support of young people. In comparison, South Africa's Quarterly Labour Force Survey for the first quarter of 2023 indicates that youths aged 15–24 years and 25–34 years recorded the highest unemployment rates of 62,1% and 40,7% respectively. TIA's sub-targets for youths range between 20% and 50%. In the context of high youth unemployment these targets are modest.

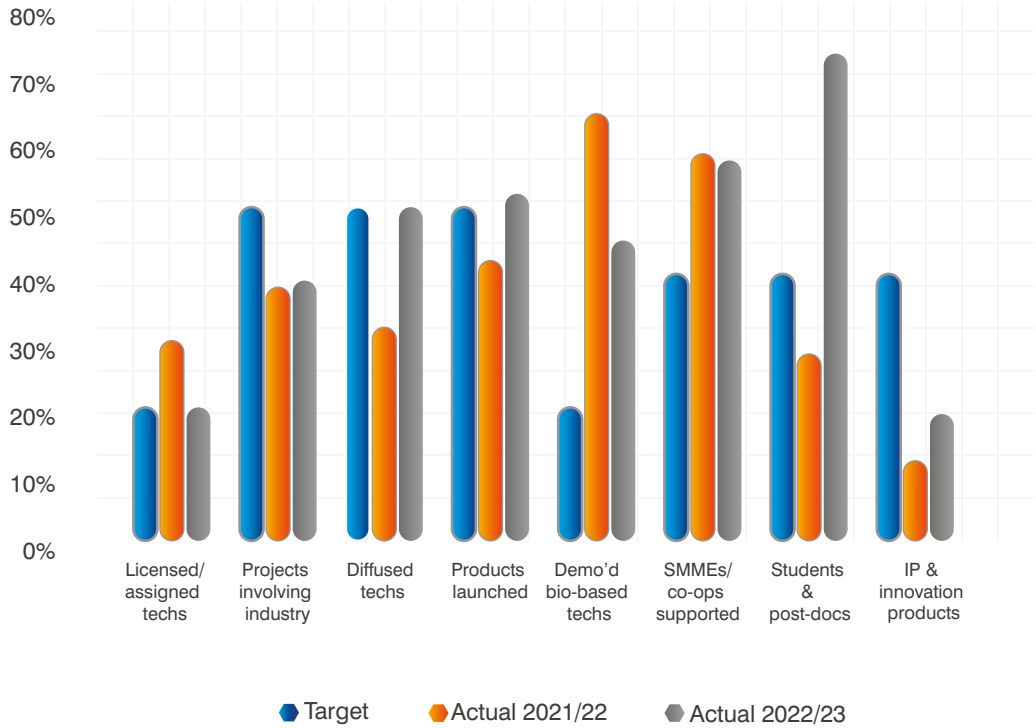


Figure 6: TIA's performance against output sub-targets for youths in 2021/22 and 2022/23

TIA did not achieve any of its eight output sub-targets for persons with a disability in 2022/23, as shown in Figure 7 – which is not a good outcome for the Agency. According to Statistics South Africa, the national disability prevalence rate is 7,5%. In comparison, TIA's sub-targets for persons with disabilities range between 3% and 10%, which means that in the context of the national prevalence rate these targets are reasonable.

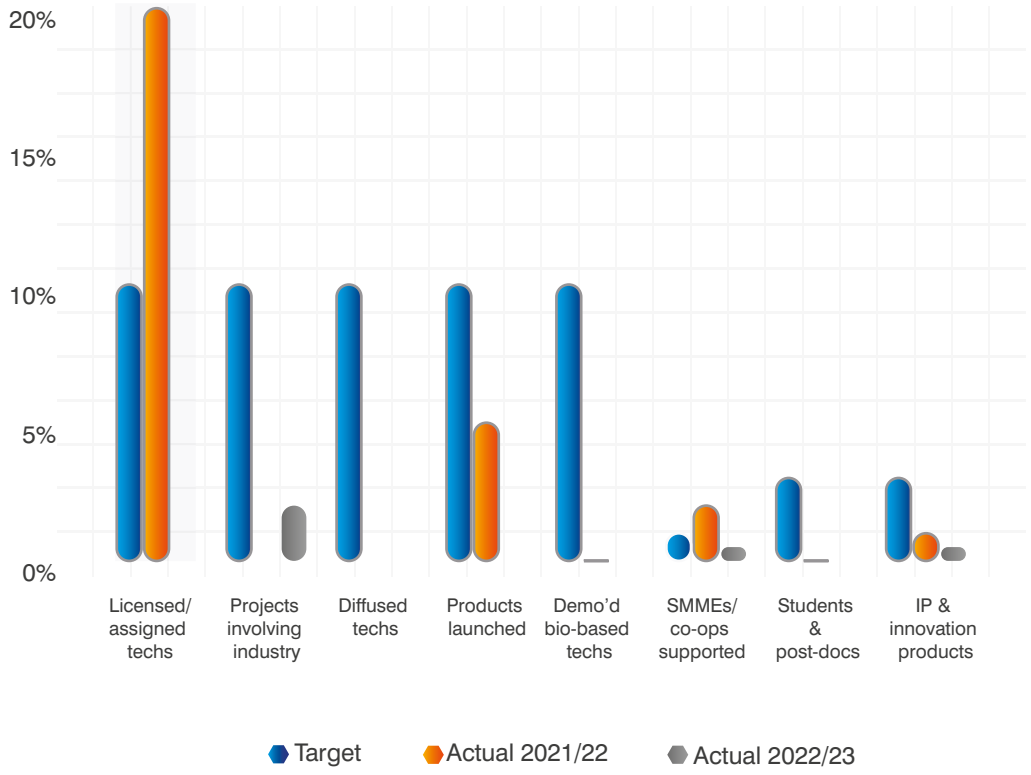


Figure 7: TIA's performance against output sub-targets for persons with a disability in 2021/22 and 2022/23

TIA recognises that its historical performance with respect to transformation and inclusion is mostly incidental, not causal. Consequently, in 2023/24 after an extensive programme design and stakeholder consultation process, the Agency obtained Board approval to establish dedicated programmes that are focused on women, youths, and persons with a disability. The Women Technology and Innovation Programme, the Youth Technology and Innovation Programme and the Disability Technology and Innovation Programme will be launched during 2024/25, subject to finalisation of the programme implementation modalities. Through these programmes the Agency will drive a strong transformation and inclusion agenda. Accordingly, its performance against its output sub-targets with respect to women, youths and persons with disabilities are expected to improve from 2024/25 onwards.

11.3. Operating environment

Internal environment

TIA has fully embraced digital transformation since the advent of COVID-19, which made it necessary for people, process, and technology changes to meet stakeholder demands. Hybrid work arrangements have become the norm, with employees working partly from TIA's offices and partly remotely. This has enabled a positive work balance for employees, which has had a positive impact on performance.

Business capabilities that are enabling hybrid work include full process automation, the provision of end-user devices and technology, together with varied information security tools for network and device protection to ensure confidentiality and maintain business integrity. Ministerial Review recommendations and looming budget cuts have increased the need for a rapid response to change. These two issues will have a continuing impact and an ability to be agile, modify itself and move forward. Change management will be one of the key focal areas through which to create lasting shifts in the way the Agency supports its employees.

These changes also bring about new risks, and accordingly the Agency has begun the process of risk identification to ensure that the adjustment and transition remain seamless.

Operational improvements

The Ministerial Review report released in December 2022 has served to affirm the mandate of TIA while calling for the strengthening of the institution to increase its impact on the NSI. This development will serve as a solid foundation from which the Agency will be able to articulate its future strategic positioning in the NSI and increase its impact. The review was commissioned because of gaps that were identified in TIA that were effectively preventing it from fulfilling its mandate. TIA that functions optimally has the potential to improve economic growth and stimulate job creation.

The path towards a re-imagined TIA that operates optimally, is expected to be achieved within ten years. In the forthcoming financial year, a new five-year strategy will be developed; this strategy will encapsulate the recommendations of the review geared towards a high-functioning organisation.

Several 'quick wins' will be attended to in 2024/25. One of these is the development and dissemination of new and existing support tools to assist investees who rely on TIA. The clear articulation of support tools is currently being put in place; this process includes TIA's investment framework (pre-investment, investment, and post-investment). This process is aimed at ensuring that the necessary support is provided to all investees at the different stages of the investment management value chain.

While not necessarily a quick win, the Agency needs to be given the capacity to ensure that skills (crucial to a recalibrated organisation) are put in place through recruitment and other means. Such capabilities include an effective and efficient portfolio management (pre- and post-investment). A transformed organisation that has the required capabilities and mindset to drive investments and, where appropriate, to implement revised investment models. Efforts to transform the organisation will accelerate in 2024/25.

Concerning the Seed Fund, efforts will be focused on ensuring the predictability of funding and the frequency of calls. This popular and often over-subscribed funding instrument requires such efforts if it is to enjoy better operational efficiency.

Regarding transformation and inclusion, TIA has historically underperformed against these imperatives. This underperformance will be dealt with by means of targeted programmes, specifically a Youth Technology Innovation Programme, a Women in Innovation Programme and an Innovation for Persons with Disabilities Programme. Spatial Transformation will continue to be pursued through targeted regional calls for funding – for example, under the Grassroots Innovation Programme. These programmes will begin making a difference from 2024/25 onwards.

TIA will seek to secure exceptions from specific sections of the PFMA, specifically sections 13 (re-investment of profits and interest in TIA activities), 51(g) (accumulated surplus), and 54(4) (acquisition/disposal of investments contemplated in s 54(2) requiring ministerial approval of transactions more than R50 million).

Investment management value chain

TIA has engaged in a process of developing a strengthened investment management framework. This is aimed at overcoming some of the challenges that have arisen in the existing framework. The low rate of approvals and the high rate of rejections in investment decision-making prompted this process. Other challenges that have arisen in the current framework include prolonged business turnaround times and poor post-investment management and monitoring.

For this purpose, a study was undertaken in September 2022. This benchmarking assessment was conducted to compare TIA's pre- and post-investment management processes, operations, and structure against those of an agency that operates in the same environment. A development finance institution was identified in this benchmarking process. The findings of the study suggest that TIA needs to review its investment management model by developing a dedicated business development intervention that will help to improve deal sourcing. The recommendations also outlined steps that would need to be taken to improve business turnaround times and project monitoring and oversight.

The proposed adjustments will help TIA to give effect to its broad mandate by ensuring the delivery of its products and services to the intended clientele in the most efficient, effective, and impactful manner.

The improvements in these processes may be accompanied by some minor to large structural changes (depending on implementation options and choices), human resources and cost implications to TIA.

Stakeholder satisfaction

The success of TIA's work depends heavily on stakeholders: this helps the organisation to be accountable and to serve stakeholder needs and expectations. As a means of assessing the way TIA is performing on these issues, the Agency conducts an annual satisfaction survey to determine stakeholder sentiment as they engage with the organisation through core divisions of the Agency. The survey further seeks to understanding the satisfaction levels among TIA clients, partners and other stakeholders that provide complementary services to innovators and to assess drivers and barriers to satisfaction and to determine any problems with service delivery.

In 2022/23 our stakeholders rated the Agency at 8,9 out of ten. This is an improvement on the 2022 edition of the survey, where the rating was 7,1. TIA appreciates the honest feedback, considering it invaluable. Figure 8 outlines stakeholder satisfaction over the past six years.

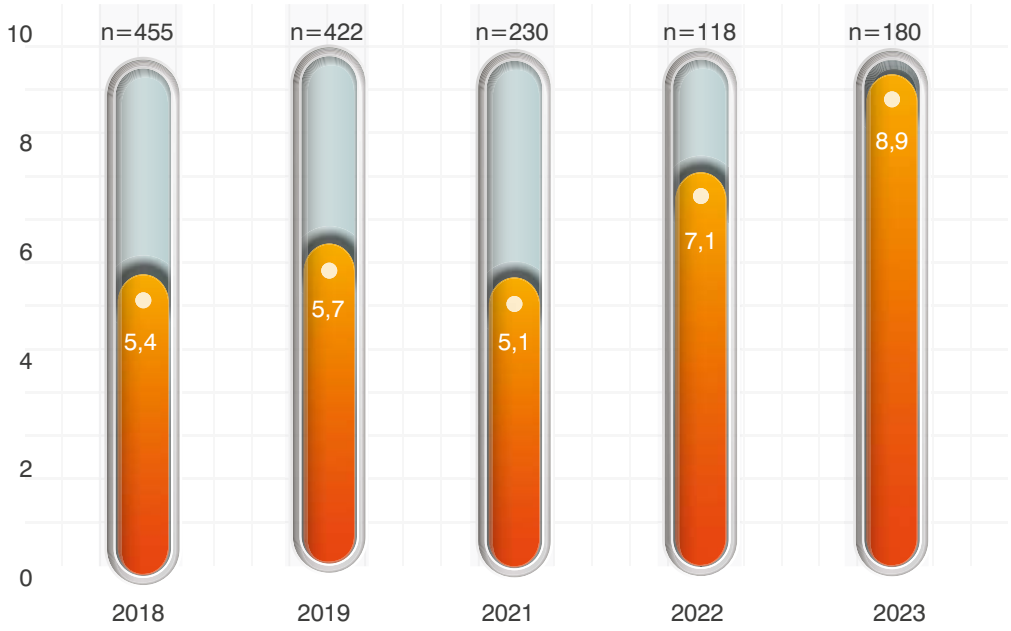


Figure 8: TIA's stakeholder satisfaction score, 2018–2023

Stakeholders that participated in the survey were the innovators, partners, and co-founders that TIA works with regularly during the year. This positive sentiment from its stakeholders is attributed to various factors, including the performance of its portfolio of projects (revenue-generating), the delivery of innovation support programmes, the various stakeholder engagement platforms used, and the promotional initiatives undertaken during the reporting period. In 2022/23 TIA hosted and participated in more than 33 events as a strategic partner, a sponsor and/or an exhibitor. TIA established its customer service platform, and this resulted in a reduction of the number of unresolved queries and outstanding referrals. It is anticipated that this trend will increase with the ramping up of various creative roadshows and stakeholder engagement initiatives.

In the case of a proportion of our stakeholders whose expectations of TIA fell short, the organisation will attempt to understand the areas of dissatisfaction based on the outcomes highlighted in the survey and then to find ways to improve its service levels. In setting out to improve the relationships with its stakeholders, TIA regularly embarks on communication drives, hosts strategic thematic engagement forums using various platforms (conferences, social media, sponsorships, etc.) and strives to create value for the shareholders, clientele, and partners.

Commercialisation enablement strategy

Commercialisation is one of the core pillars of TIA, one that is positioned to redress the systematic inadequacies of supporting the translation of South African technological innovations. This Commercialisation Enablement Strategy was developed in 2022/23 and is expected to be approved in 2023/24. The strategy is a pragmatic framework that underpins the exploitation of publicly funded assets in support of discharging TIA's mandate. Concurrently, the strategy also supports key national strategic initiatives led by the principal shareholder, the DSI and the broader NSI towards transforming the growth trajectory of the South African economy.

The Commercialisation Enablement Strategy underpins concerted efforts aimed at economic transformation and job creation by supporting the exploitation of publicly funded R&D to establish new sources of income for the state by using IP as a tool for economic development. The strategy delivers pragmatic antidotes to the systematic inadequacies identified along the innovation value chain both internally at TIA and within the broader NSI.

11.4. Financial overview

TIA had an allocation of R460 million for 2023/24 with a commitment book of R209 million, with more than R251 million available for investments and operational expenditure. While this funding is inadequate for the purposes of fulfilling the organisation's mandate effectively, the additional funding from round three of the Innovation Fund (R100 million) has served to bridge this funding gap, especially given that no inflationary increase has been built into the following financial years in the MTEF.

The DSI established the Innovation Fund that will enhance South Africa's capacity to facilitate and accelerate the commercialisation of technological innovations. The objectives of the fund are to serve as an opportunity to de-risk investments through technology development and demonstration, and as a catalyst for co-investment and follow-on investment from industry and private-sector sources (commercial funding). The focus remains on creating an impact, such as growing the economy, creating jobs, increase exports and contribute to the fiscus. The fund also functions as an important instrument to transform the VC landscape.

TIA received an initial allocation of R80 million for a portfolio of 20 projects approved by the DSI under Phase 1 of the Innovation Fund. Under Phase 2 R102.2 million has been received and R100 million under Phase 3. These funds have enabled TIA to invest in a portfolio of projects in which it had invested in technology development funding, thereby further de-risking these locally-developed technologies, thereby attracting follow-on funding. Two successful investments are summarised hereafter.

TIA invested in Artisan Biomed through the Innovation Fund to develop various precision medicine offerings based on a set of newly developed or enhanced tests using local genomics capabilities. TIA's loan of R5 million, which has been fully repaid with interest, enabled the company to attract follow-on funding of R70 million from Mediclinic Southern Africa which will help to capitalise the company to acquire equipment, grow its skills base and develop new precision medicine solutions for the public.

TIA has also invested in Stone Three, a company that solves real-time measurement problems with industrial AI-augmented machine vision and remote AI-augmented process monitoring and diagnostics, which improves the efficiency of minerals processing. With R5,5 million in Innovation Fund support, Stone Three has grown internationally, having garnered projects in Chile, Australia, South Africa, and Europe. Stone Three increased its levy payment to TIA from R717 198 to R1,4 million in 2022/23, and the company continues to pay its Innovation Fund loan repayment instalments of R338 453 per quarter.

Alongside the Innovation Fund and to minimise the funding deficit for technology development and to bridge the gap to commercialisation, TIA developed the Industry Matching Fund through which the Agency established partnerships with the private sector and other public institutional funders and incubators, but particularly VC companies, the angel investor community and institutional investors. This fund-of-funds model took a modest portion of TIA funding and co-invested it with private funders. Through contributing a seed capital of R28 million into the Industry Matching Fund, TIA attracted a total co-funding of R451 million.

Following the success of the Industry Matching Fund TIA expanded the fund-of-funds model in support of transforming the profile of the South African VC landscape. In advancing the transformation agenda, as articulated in the White Paper on Science Technology and Innovation, and emphasised in the Decadal Plan, TIA sourced opportunities from black-owned and managed VC companies for co-investment with TIA through the Innovation Fund. As a result, two black VC companies were identified and earmarked to receive Innovation Fund funding.

In 2024/25 TIA has partnered with the South African SME Fund to jointly implement the Innovation Fund in a fund-of-funds approach, targeting the VC Seed stage. This joint project has been dubbed the High-Impact Seed VC Fund-of-Funds (HISVCFoF). Analysis of the funding landscape shows that while there is a gap with regards funding for scaling and commercialisation of locally-developed technologies, that there a much larger gap in Seed funding in South Africa, with early-stage companies struggling to raise Seed funding locally.

The HISFoF will broadly focus investment into the priorities identified in the Decadal Plan, as well as the so-called "deep tech" areas. These areas would be outside fintech and other service-related technologies that feature in the portfolios of VC companies, due to their inherently shorter times to market in comparison with technology areas like biotech and technologies for productive industries in the primary (e.g. forestry, mining) and secondary (e.g. manufacturing, construction) sectors.

Going into the 2024/25 financial year, TIA has an allocation of R480,7 million which represents a 4% increase from the previous year. While this funding remains inadequate for the purposes of fulfilling the organisation's mandate effectively, the additional funding from the Innovation Fund will serve to bridge this funding gap. To respond to the ever-increasing demand for TIA funding, the Agency must continue to identify and secure alternative sources of funding and revenue. Given the excellent track record of deploying funds as supported by the current year's performance, the Agency is well poised to deploy funds effectively in the NSI and to continue to bolster its funding capacity through leveraging its partnerships effectively.

PART C

MEASURING PERFORMANCE

TIA's 2020–2025 Strategic Plan seeks to reposition the Agency within the NSI and rests on three pillars, which are the basis of the Agency's three outcomes over the five-year period:

12. Commercialisation

12.5 Outcome 1: Commercialised innovations

Impact statement

TIA aims to commercialise innovations that are economically sustainable to have a positive impact on the lives of all South Africans.

Outcome statement

TIA seeks to direct a greater proportion of its resources towards the translation and commercialisation of IP emanating from publicly funded organisations such as universities and science councils for the purpose of improving the lives of South Africans and contributing to economic growth and development. The Agency's progress towards achieving Outcome 1 during the 2020–2025 Strategic Plan period, will be tracked by reporting on the number of technologies commercialised annually.

12.6 Planned outputs and output targets

To achieve the desired outcome of an increased rate of commercialisation of knowledge and innovation outputs for socio-economic stimulation, growth and development, TIA has developed five outputs.

The Agency aims to increase the conversion rate of IP from publicly funded research organisations by exploiting the resources of the private sector and promoting the Agency's competitiveness. Licencing, assigning, or selling publicly funded IP associated with technologies that have been de-risked by the Agency, and fostering joint collaborations between publicly funded research organisations and industry are two pathways with which to foster the conversion rate of such publicly funded IP.

The diffusion of existing technologies to community structures, SMMEs, co-operatives and other business formations for inclusive socio-economic development represents TIA's third output. The fourth output is having start-ups or SMMEs launch products into the market, this being an important measure of the success of commercialising innovations fully.

Finally, TIA will track royalty payments, revenue generated through the sales of TIA-supported products, processes and services, and the proceeds of equity exits. Income from the proceeds of TIA-supported initiatives serves to demonstrate TIA's direct impact on the economy regarding the successful commercialisation of innovation.

TIA's output targets in support of commercialising innovations are presented in Tables 7 and 8.

Table 7: Outcome 1 outputs, performance indicators and targets

Outputs	Output indicators	Audited actual performance			Estimated performance	MTEF period targets		
		2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
1.1 Technologies licensed or assigned	Number of licensed or assigned technologies	6	10	15	20	25	30	35
1.2 Joint collaborations between publicly funded research organisations and industry	Number of projects involving industry being executed	29	34	48	50	52	56	60
1.3 Technologies diffused for inclusive development	Number of successfully diffused technologies	5	12	18	20	24	28	32
1.4 Products launched	Number of products launched	21	37	43	40	44	48	52
1.5 Revenue derived from commercialised innovations[10]	Total rand value of royalties, sales and exits	New indicator	New indicator	New indicator	R10m	R15m	R20m	R25m

Table 8: Outcome 1 output indicators, annual and quarterly targets

Output indicators	Annual target	Q1	Q2	Q3	Q4
1.1 Number of licensed or assigned technologies	25	4	5	6	10
1.2 Number of projects involving industry being executed	52	8	11	16	17
1.3 Number of successfully diffused technologies	24	4	5	6	9
1.4 Number of products launched	44	7	8	12	17
1.5 Total rand value of royalties, sales and exits	R15m	R2m	R3m	R5m	R5m

12.3 Explanation of planned performance

The Decadal Plan has confirmed technological innovation as one of the most critical drivers for improving the economic competitiveness of the key sectors of the South African economy: agriculture, manufacturing, and mining. These sectors have been earmarked for modernisation and revitalisations, through 'hi-tech' industrialisation.

Pursuant to the objective of the Decadal Plan to modernise the agricultural sector, mining and manufacturing industries and the digitisation of the economy, TIA will continue to intensify efforts in this direction. In the agricultural sector work will include supporting and commercialising cutting-edge technological innovations that not only deliver automated precision-driven operations but also enhance productivity, seedling yield and survival rate at reduced costs.

As part of the systematic interventions to enable innovation and to translate IP into commercial products diffused into the marketplace, we will strengthen the opportunity management process for a high-IP pipeline by accessing specialised knowledge and competencies from TIA's Technology Stations Programme (TSP) for SET expertise. This will help to minimise the complexity and to assess the technical feasibility and competitiveness of high-IP technology innovations. We will also attempt to tap into our existing Seed Fund Programmes to harness a bouquet of high-potential industrial, social and digital pipeline opportunities that have been de-risked for technology development and market validation. These interventions will foster increased collaboration and partnership between industry and academia.

[10] This is a new output and output indicator as at 2023/24. The 'old' output 1.5 (Leveraged funds) has been moved in support of Outcome 3. The reader is referred to Section 14.2 of this report in this regard.

Manufacturing

TIA supports and prioritises the commercialisation of innovative technologies that have matured to the pre-commercialisation stage. Its current portfolio of projects stretches across but is not limited to these sub-sectors. Planned commercialisation interventions include securing the next round of commercialisation funding of late-stage portfolios, finalising exit or equity negotiations on exit-ready projects and demonstrating technologies for global market uptake internationally.

Through the Advanced Manufacturing function, TIA will support the transformation of South Africa's manufacturing industry into a competitive, high-tech, and high-value-creation industry. The manufacturing sector is becoming increasingly heavily dependent on ICT platform technologies for the transition to Industry 4.0 (I4.0). Accordingly, the focus during the next five years will be on improving manufacturing competitiveness by adopting and diffusing technology. This it will achieve by embracing low-cost digitisation and digitalisation technology solutions that are easily transferable and scalable across manufacturing sub-sectors.

In addition, TIA will focus its efforts on new areas such as Industry 4.0 – with specific emphasis on smart factories, smart materials and advanced robotics and additive manufacturing. For maximum economic impact, the focus will be on technologies that have applications in aerospace (radar), medical, tooling, and improved product development through deepened collaboration with the TSP. Meanwhile, further progress will also be made on projects in the radar area that were onboarded during the previous financial year.

The Manufacturing NSI remains weak, primarily due to talent-driven innovation not having the same degree of competitiveness and scale as its global peers. Education in science, technology, engineering and mathematics at the levels of basic and higher education remains a concern because it directly affects the achievement of critical mass of manufacturing skills required to form one of the fundamental pillars of manufacturing competitiveness. In addition, South Africa's industrial policy lacks coherence and alignment, and historically there has been a 'massive' fragmentation across government departments. South Africa continues down a path of de-industrialisation, which has been leading to a drastic slowdown in the manufacturing sector. This situation also serves to deter foreign investment.

TIA's critical role in NSI co-ordination will focus on improving collaboration with key players in the Manufacturing NSI in order to leverage both resources and capability in different areas, with the Agency leading the agenda on innovation. Crafting national collaborative programmes and projects will be emphasised that will support economic growth, job creation (with a focus on persons with disabilities, youths, and women) and geographic distribution. Opportunities in emerging areas such as additive manufacturing will be prioritised.

Natural resources

TIA will continue to play a pivotal role in supporting and diffusing technologies that harness emerging market opportunities in the green economy. Green economy opportunities will be aimed at dealing with ameliorating climate change and promoting technologies that modernise the fields of mining and minerals processing, mineral beneficiation, and water resource management. We will continue to grow new industry players in the circular economy in order to build a stronger ecosystem and value chain for transformation and economic development. Furthermore, we will offer ongoing support for these investments with the express focus on prioritising strategic interventions that promote key national imperatives. The circular economy is also a growing opportunity, and here collaboration has started with the Council for Scientific and Industrial Research (CSIR) and the DSI, the Waste Roadmap being the guiding framework.

Mining and mineral beneficiation and the country's water crisis are the critical key imperatives. Two major programmes – Wastewater and Water Leaks – will be the focus for the future, both programmes seeking solutions to the water crisis challenge. The Wastewater Programme encompasses the following focus areas: digitisation, asset management, operational efficiency, stakeholders and skills development. In this regard, Innovate UK and TIA have collaborated in a joint Wastewater Programme, with the Agency contributing R5 million and Innovate UK R12 million to it. The Water Leaks Programme encompasses the following focus areas: digitisation, asset management, operational efficiency, stakeholders and skills development.

The mining sector continues to contribute significantly to the GDP growth of the country. The sector remains a priority towards achieving modernisation and transformation. TIA will continue to implement strategic interventions and commercialise novel technologies that advance the ways we extract raw materials, process minerals, and diversify new sources of growth and international export. This will be achieved through our dedicated investments and strategic partnerships. The Smart Sensor technology system from the Natural Resources portfolio is a system that integrates hardware and software programs in order

to monitor mineral processing. The system positively affects the ability to measure difficult material properties, throughput, stability, quality, grade, and recovery. The technology currently generates revenue and continues to show greater potential for gaining access to international export markets.

Energy

The country needs deliberate strategic interventions and collective buy-in to curb the current energy crisis. The uncertainty of energy security and its overall adverse impact on all sectors of the economy remain a continuing concern for all. The sector has experienced macroeconomic shifts that affected the prices of oil and gas adversely. The impact of human-caused climate change is increasingly evident around the globe; this has led to a transition towards a global mix of renewable energy, nuclear and hydrogen. An ongoing preoccupation remains that increased carbon emissions have triggered much-needed interventions to unlock greater market opportunities, including policy reform and technology innovations in the energy sector.

We remain resolute in promoting the energy sector's imperatives of economic growth and social equity through expanded access to energy services and employing environmentally sustainable practices. TIA supports a low-carbon economy with a climate-resilient focus. The Just Energy Transition is supported by opportunities in eMobility and hydrogen.

Deliberate collaboration with the World Climate Foundation continues. This collaboration creates opportunities for international stakeholders and, in particular, funders. In addition, support is also in place for a study, with the Presidential Climate Commission Secretariat identifying the Just Energy Transition and the technology landscape in South Africa. Our role and focus are to facilitate the integration of hydrogen-related technologies into various sectors of the South African economy and to stimulate economic growth prospects.

In support of the national Hydrogen Society Roadmap, TIA has approved and disseminated the hydrogen economy proposal. Its aim is to invite suitable innovators currently developing energy technologies in the hydrogen economy with a niched focus on fuel cells for mobile and stationary applications, green hydrogen, infrastructure for storage, distribution, and dispensing hydrogen to participate in this programme.

ICT

Our investments in advanced ICT technology innovations and IP continue to bear much-needed commercial fruit. They are leading to the creation of new high-tech commercial ventures and also new sources of economic growth. Most TIA-funded ICT sectoral technologies can be applied and generate a market footprint across many industry verticals through the underlying IP. The nature and complexity of ICT systems we have enabled the resolution of a plethora of social and industrial benefits. These are driven by underlying cutting-edge capabilities such as AI and machine learning, blockchain, fintech, IoT, broadband connectivity, space innovations, cybersecurity and digital social enterprise systems which will contribute directly to growth in the economy.

In addition, there will be efforts to develop the concept of technology hubs in collaboration with stakeholders in the NSI. TIA will also be working on strengthening its relationship with the DSI-funded Foundational Digital Capabilities Programme. Its key outcome will be to stimulate the implementation of the programme.

The planned strategic initiatives in support of Outcome 1 are presented in Table 9.

Table 9: Strategic initiatives in support of Outcome 1

Topic	Challenge or opportunity	Strategic initiative
Commercialising publicly funded R&D for socio-economic benefit	Ad-hoc and sub-optimal technology commercialisation practices across the organisation	Implement an organisation-wide Commercialisation Enablement Strategy, including the use of appropriate instruments, e.g. convertible instruments
	IP leakage leading to loss of the opportunity to harvest the gains of public investment in RDI, including the lost opportunities of contributing to the fiscus and to society broadly	Implement the findings and remedial actions stemming from an independent study commissioned to investigate publicly funded IP leakage, both at a national and a TIA level
	Regulatory hurdles to TIA's commercialising publicly funded IP by creating spin-out companies	Participation in the DSI-led Working Group to explore and seek an exemption to relevant sections of the PFMA
	Opportunity to leverage off pockets of IP strength and technological capabilities in publicly funded research institutions	Strategic alignment partnerships with key public research organisations that collectively possess the bulk of SA's national technological capabilities in radar science and engineering, and in nuclear medicine
Leadership in the 4IR	Sub-optimal co-ordination and alignment of TIA's 4IR investments	Formulate a TIA-wide 4IR Strategy
Energy security	Ensuring a Just Energy Transition for South Africa	• Collaboration with Eskom in repurposing and re-powering its old coal fleet • Collaboration with the Presidential Climate Commission Secretariat in dealing with SA's climate issues
	Decarbonisation of South African industry	Support the implementation of the Cabinet-endorsed Hydrogen Society Roadmap (policy)

12.4 Resource considerations

Table 10: Commercialisation Division: expenditure estimates

	2024/25 (R'000)	2025/26 (R'000)	2026/27 (R'000)
Income	**97 941**	**110 489**	**124 880**
MTEF ring-fenced	-	-	-
MTEF baseline	97 941	110 489	124 880
Other income (specific contracts, interest and royalties)	-	-	-
Operational expenditure	**26 637**	**27 568**	**28 540**
Support and infrastructure costs	5 960	5 960	5 960
Human resources	20 677	21 607	22 580
Investment expenditure	**71 304**	**82 921**	**96 340**
MTEF allocation	71 304	82 921	96 340
Specific contracts	-	-	-

13. Bio-economy

13.1 Outcome 2: Delivering on the Bio-economy Strategy

Impact statement

TIA aims to stimulate a productive bio-economy through technology innovation, thereby making a significant contribution to South Africa's economy.

Outcome statement

TIA is the leading implementer of the innovation-focused aspects of the Bio-economy Strategy through which South Africa's unique biological resources, historical biotechnology investments and bio-based capabilities are used for greater socio-economic value. To track TIA's progress towards achieving Outcome 2 over the 2020–2025 Strategic Plan period, the TIA will report on the number of successfully demonstrated bio-based technologies and the number of bio-based entrepreneurs and organisations accessing high-end SET services.

13.2 Planned outputs and output targets

To stimulate a productive bio-economy, TIA has developed three outputs with the purpose of stimulating entrepreneurial activity in the bio-economy.

First, the Agency will support the demonstration of bio-based technologies, products or services in agriculture, health, industrial biotechnology, IKS and other bio-based domains. Second, it will increase the impact of existing Technology Platforms across the country which offer high-end bio-based SET support to the biotech community. In addition, it will exploit emerging opportunities in strategic industries to establish new Technology Platforms. Finally, the Agency will support a number of Technology Innovation Clusters in implementing collaborative innovation projects and activities in support of targeted bio-based industries.

TIA's output targets in support of delivering on the Bio-economy Strategy are presented in Tables 11 and 12.

Table 11: Outcome 2 outputs, performance indicators and targets

Outputs	Output indicators	Audited actual performance			Estimated performance	MTEF period targets		
		2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
2.1 Bio-based technologies developed	Number of successfully demonstrated bio-based technologies	9	36	37	30	37	40	45
2.2 Technology Platforms managed and supported	Number of Technology Platforms that are operational and functional	7	8	8	9	10	10	10
2.3 Technology Innovation Clusters managed and supported	Number of Technology Innovation Clusters that are operational and functional	5	7	7	9	11	12	12

Table 12: Outcome 2 output indicators and annual and quarterly targets

Output indicators	Annual target	Q1	Q2	Q3	Q4
2.1 Number of successfully demonstrated bio-based technologies	37	7	8	11	11
2.2 Number of Technology Platforms that are operational and functional	10	–	9	–	10
2.3 Number of Technology Innovation Clusters that are operational and functional	11	–	9	–	11

13.3 Explanation of planned performance

The bio-economy has attracted significant interest as a means of overcoming some of the major challenges characterising the 21st century. The cross-cutting nature of the bio-economy offers a unique opportunity to comprehensively deal with interconnected societal challenges, such as healthcare and the burden of disease, food security, the scarcity of natural resources, the dependence on fossil fuels and climate change.

Advancements in biotechnological research and the resultant uptake of innovation will allow South Africa to improve the management of its renewable biological resources and open up new and diversified markets in food and bio-based products. South Africa has significant capacity for knowledge-generation in the bio-economy domain. TIA aims to support the translation of these knowledge resources into sustainable bio-based solutions that have the potential to stimulate inclusive and sustainable economic growth, increase the number of jobs and businesses, foster a healthier population, and improve the economic and environmental sustainability of primary production and processing industries.

TIA aims to operate as an industry-builder in the bio-economy by supporting bio-entrepreneurs and creating new products and new markets. The Agency supports the translation of South Africa's knowledge resources into sustainable bio-based solutions that deal with societal challenges while contributing to sustainable economic growth.

To take on the challenges and opportunities in the bio-economy, TIA has embraced continental and global thinking about models for the use of renewable biological resources that will drive economic development and the circular economy. In doing so, the Agency aims to redress the challenges in food security, biodiversity, environmental sustainability, health, and industrial processes. The planned activities for 2024/25 and beyond will include implementing the aspirations of the White Paper on STI, supported by the DSI's Decadal Plan. Deliberate associations with the DSI through bilateral communities of practice are envisaged to ensure alignment and cohesion in planning and delivery.

TIA will, through both existing and new initiatives, seek to contribute to the national NSI priorities centred on, but not exclusive to, the Decadal Plan as follows:

- Intensify agricultural R&D.
- Support the registration of IP such as plant-breeders' rights.
- Develop drought- and pest-resistant varieties and cultivars.
- Improve sector competitiveness throughout agricultural value chains.
- Fund smallholder farmers by providing access to digital technologies for decision support.
- Enable smallholder farmers to gain access to markets by supporting phytosanitary, food safety and accreditation enterprises.
- Support the development of local solutions in health (digital and otherwise), inclusive of resource-poor settings.
- Provide further support for the development of precision medicine technologies.
- Support the establishment of a complementary health system rooted in South Africa's diverse knowledge resources that fulfils the diverse healthcare needs of the population.
- Localise bio-manufacturing and the manufacturing of active pharmaceutical ingredients for health through increased internationalisation and inbound technology transfer, leading to rapid economic prosperity.
- Industrialise bio-processes and their incorporation in the circular economy.
- Support the DSI in implementing South Africa's vaccine manufacturing strategy, which constitutes a pivotal roadmap to establishing a robust and sustainable vaccine manufacturing ecosystem.
- Intensify the Technology Platforms Programme for developing high-end technological capability and infrastructure that supports the generation of new knowledge; this they should do by building on existing platforms for greater impact and by supporting local critical mass in next-generation technologies and systems biology.
- Implement bio-entrepreneurship interventions to benefit the start-up community – the interventions should enable entrepreneurs to advance innovations beyond the technology demonstration stage.

TIA is expected to play a leadership role in the implementation of the innovation aspects of the Bio-economy Strategy. The success of TIA in this role hinges on a co-ordination approach in the NSI. The mitigation measures that will be undertaken to avert the risk of sub-optimal implementation of the Bio-economy Strategy includes TIA working with the DSI to co-ordinate system-wide interventions to bring TIA IKS, Health, Industrial Biotech, and Agriculture Units in closer proximity to the DSI's strategies and plans. An inclusive and co-ordinated approach will result in an effective and impactful TIA.

Agriculture

The goal of the Bio-economy Strategy for agriculture is to boost agricultural bioscience innovation to ensure food security, improve nutrition and health, and also to enable job creation by growing and intensifying sustainable agricultural production and processing. TIA will contribute either financially and/or non-financially to developing high-impact technologies, products, and services. These will result in a competitive, broad-based, inclusive, and sustainably growing agricultural sector.

The Agriculture Bio-economy Innovation Partnership Programme (ABIPP) will continue to be one of the flagship contracted programmes of the DSI, managed by TIA through several funding agreements. Significant milestones such as the Biosecurity Hub and the participation of industry partners and associations will continue to be supported. The focus of smallholder farmer development will be accelerated to ensure diversity and equity in agriculture aligned to the country's development agenda.

In support of collaborations, TIA recognises the important role of the AgriFood Technology Station at the Cape Peninsula University of Technology and the Limpopo Agro-Food Technology Station at the University of Limpopo. Deliberate attempts will be made to create opportunities for partnering between TIA and these Technology Stations.

Indigenous knowledge systems

The Indigenous Knowledge Systems focus areas support technology development and the commercialisation of indigenous knowledge-based bio-innovations. This mandate is strategically discharged across four key thematic areas: African traditional medicine, cosmeceuticals, health infusions and nutraceuticals. In this regard, an effort will be made to improve the lives of ordinary people living in the most rural parts of South Africa and of other categories of indigenous knowledge holder. The development and commercialisation of technological innovations that are derived from ancient knowledge guarantees benefit-sharing for these indigenous knowledge holders, most of whom are rural communities.

TIA will establish facilities to assist in product development and the pre-commercial manufacturing of nutraceuticals and cosmeceuticals. In addition, the Agency will use the capabilities of its innovation infrastructure in the Technology Stations to support these initiatives. Such initiatives will complement the current investments made by the Agency at University of the Free State (UFS) in African Traditional Medicines. This comprises broadly the Agency's support of the IKS-focused AMITD at the UFS which strives to exploit the value inherent in indigenous knowledge and indigenous biodiversity to respond to community health needs and resolve industry research challenges.

The research and outcomes of the South Africa–China Traditional Medicines Flagship Programme between the UFS and the Beijing University of Chinese Medicine further complements and enhances the impact of the investment made by TIA towards AMITD at the UFS.

The Natural Indigenous Products Programme (NIPP) Fund is a joint fund established by TIA and the IDC for the purposes of supporting indigenous knowledge-based and natural products-based bio-innovations. It was established to also support entrepreneurs directly and capacitate business support organisations to enable them to assist entrepreneurs in this industry. The Fund will provide funding for the requisite capital expenditure, working capital and operational expenditure to address the financing needs of the natural products industry, which will address the lack of early-stage commercialisation financing (seed, angel, VC) after the product development is complete. This fund will be grown by co-opting additional partners from industry, the private sector and government, as was initially envisaged. The desired outcome of the NIPP Fund is to leverage funds from other participating partners.

The Cannabis and Hemp Phakisa Action Lab report details the interventions required from a systemic level to unlock or remove obstacles to the realisation of the cannabis and hemp industrialisation opportunities in South Africa. The several workstreams were devised to catalyse the implementation of the Cannabis Masterplan, and to ensure policy coherence and collaboration between government departments. The report speaks to the regulatory reforms that will be required to unlock these opportunities. The NIPP Fund is in favour of scaling up support for the existing catalytic projects put in place by the DSI and the CSIR by leveraging funding and technical support from the likes of the CSIR and the IDC, which, when supported enterprises are sufficiently de-risked, will attract private sector investment for manufacturing and commercialisation scale-up. Furthermore, the identification of appropriate enterprises critical to ensure the enablement of public

sector and private sector investment to bring black farmers into the mainstream of commercialisation as input suppliers and processors. TIA's investment leverages funding, and partnerships, as envisaged.

Health

Access to affordable high-quality healthcare is still very much a challenge. The severely under-resourced public health sector continues to cater to the largest population in the country (84%), while the highly resourced private health sector caters to only 16% of the South African population. This has clearly created a big divide in healthcare between the rich and the poor. To fill this gap, the government has embarked on efforts to create the national health insurance scheme, which is aimed at pooling funds with sufficient reserves for high-cost care. South Africa is also grappling with the spiralling cost of healthcare.

TIA has an important role to play in supporting innovations for pandemic preparedness and the establishment of local manufacturing capabilities in South Africa. Pandemics such COVID-19 have highlighted the critical need for self-reliance in healthcare, especially regarding the production of essential medical supplies and vaccines. By establishing a robust ecosystem of innovation in pandemic preparedness, the Agency will ensure that South Africa is better equipped to respond swiftly to future health emergencies. This support would encompass the development not only of vaccines and therapeutics but also of innovations in diagnostics, healthcare infrastructure and supply chain management, all of which are vital components of an effective pandemic response.

The establishment of local manufacturing for essential healthcare products, including vaccines, is essential to achieving healthcare self-sufficiency. Dependence on international suppliers can lead to vulnerabilities and delays during crises. By supporting local manufacturing initiatives, TIA will bolster South Africa's resilience against future pandemics by ensuring a reliable supply of critical medical products. This effort would create jobs, stimulate economic growth, and reduce the nation's reliance on external sources, thus enhancing the country's overall healthcare security.

Precision (or personalised) medicine, defined as an emerging approach to disease treatment and prevention, considers individual variability in genes, environment, and lifestyle. This enables healthcare professionals to predict more accurately the treatment and prevention strategies that will work in groups of people. Numerous technology developments could revolutionise healthcare in the country, and it is important for TIA to take the lead in establishing such capabilities.

Substantial growth has been observed in eHealth, which is promising to provide a myriad of solutions to South Africa's healthcare challenges. In response to the pressing national needs and this growing global trend, the South African Department of Health has drawn up an eHealth Strategy which is aimed at developing an integrated national patient-based information system that is able to interface with other systems used in the health sector. In broad terms, eHealth covers technologies that encompass electronic health records, routine health management information, consumer health informatics, virtual healthcare, mHealth, and health research.

Industrial biotechnology

TIA's Industrial Biotechnology focus is on supporting the development and commercialisation of technologies that promote the green economy and environmental sustainability. Key areas of intervention include strengthening the development of bio-manufacturing capacity, the creation of partnerships to enhance the diffusion of green technologies and the support of the establishment of SMMEs to create sustainable jobs. Interventions by the Agency in this regard are strategic, enabling the development of industrial processes and ultimately contributing to the industrialisation strategy and policy of South Africa.

The Strategic Industrial Bio-Innovation Programme (SIIP) was established by TIA and the DSI to fund and co-ordinate multidisciplinary programmes, with the aim of enabling partnerships across institutions. The intention of the programme is to develop new technologies, products and processes and to support SMMEs, promote the green economy and create sustainable jobs. The SIIP Programme comprises of five sub-programmes:

1. Bioremediation Demonstration Initiative.
2. Industrial Bio-economy Demonstrations.
3. Industrial Biocatalysis Hub.
4. Forestry Bio-economy Cluster.
5. Bio-entrepreneurship Business Development.

TIA will continue to support the attainment of milestones by funded initiatives, seeking to de-risk opportunities for follow-on investment from large industry players in the establishment of bio-refineries.

The Industrial Biocatalysis Hub is an initiative of TIA in partnership with the DSI that is being implemented by the CSIR. The objective of establishing the Hub is to provide a platform to support SMMEs in the bio-manufacturing sector using biocatalysis technologies to develop and commercialise mature technologies. The aim is to support the use of green technologies in the manufacturing sector. The envisaged response to global initiatives in green technologies is being met, with the promise of new innovations.

The South African BioDesign Initiative is a biotechnology Seed Fund Programme that supports cross-functional innovation in genomics and related biological disciplines (synthetic, structural and systems biology). The programme places strong emphasis on transformation and skills development for higher-degree postgraduates. Through this programme, TIA will continue to support the DSI's Decadal Plan-linked vison of a capable state, achieved through investment in human resources.

Technology innovation clusters

TIA is arguably the only implementing agency of the government-funded Technology Innovation Clusters. These Clusters facilitate an enabling environment for advancing technology innovation and commercialisation. They also provide a collaborative multi-stakeholder vehicle following a broadly inclusive and coherent ecosystem approach geared to identifying and achieving common objectives in order to create a knowledge-based economy in areas of national priority. For this reason, the Agency will continue to support the Active Pharmaceutical Ingredients Cluster Programme, which is a strategic government initiative aimed at creating local active pharmaceutical ingredients used in critical medicines in SA. This is aimed at reducing costs and reliance on global counterparts for critical medicines. The Medical Devices and Diagnostics Innovation Cluster is a national initiative created to exploit a high concentration of skills, expertise, infrastructure, and companies across South Africa in the medical devices field. The initiative, supported by TIA and the DSI, is aimed at stimulating and intensifying technology innovation in the sector plus encouraging the formation of an integrated ecosystem in support of increasing the competitiveness of the industry.

TIA, through the Animal Health Technology Innovation Cluster Programme, will continue to provide much-needed support to the animal health sector, which is very underdeveloped, being responsible for only 0,02% of economic output or value added compared to its 0,09% contribution to the national trade deficit (according to the Statistics South Africa report of December 2022). Significant progress has been made by TIA in ensuring support for the Beef Genomics Programme, and this will continue to be supported through the deliberate inclusion of smallholder beef farmers. Similarly, the Dairy Genomic Programme will be assisted by the Agency to on-board key industry players who will drive the Dairy Genomic Cluster but, more importantly, drive the inclusion of smallholder farmers in the dairy sector.

Forest Bio-economy Innovation Cluster will see the implementation of the review recommendations, which in the main advocate both transformation and greater participation by smallholder forestry players throughout the value chain.

Technology platforms

TIA's Technology Platform Programme is designed to provide funding and support to facilitate access to key infrastructure and related technologies to players in the various value chains to conduct technology development and innovation. The Agency uses this programme to realise several objectives:

- Intervene systematically in specific value chains within priority sectors where technology gaps are a hurdle to the development and commercialisation of innovation.
- Create local technological capacity and the critical mass of expertise to undertake further technology development with commercial prospects.
- Promote pre-competitive technology development collaboration among industry partners.
- Promote shared R&D priorities between industry and academic players in the same innovation value chains.
- Exploit economies of scale and lower the risks of failure by clustering related projects around shared facilities.

TIA will continue to support existing platforms by scaling up its contribution to the stated objectives. It is the intention of the Technology Platforms Programme to invest in the bio-manufacturing capability by increasing the number of new platforms, and access to them, within the next ten years of the Decadal Plan. This will be in support of the stated intention of the Decadal Plan to support Technology Platforms (and Technology Innovation Clusters) for the next decade.

The planned performance of TIA considers the situational analysis described in this document. Specifically, the interventions planned have taken the aspirations of the Decadal Plan into account. The digitisation of health and health services is in direct response to the challenges faced by developing countries as the advent of the 4IR becomes a reality. The targets for ensuring that South Africa has a heathier and productive population, as articulated in the NDP, are accommodated by the planned initiatives of the Health and Agriculture focus areas. In the case of the Agriculture focus area, food insecurity is catered for by continuing support of the ABIPP programme, which seeks to ensure the diffusion of high-end technologies to smallholder farmers as a means of ensuring their participation in the mainstream economy. A focus area here is the development and rollout of climate-smart technologies, which in the main respond to the challenges of climate change, more notably agriculture in the context of a water-scarce environment

The planned performance accounts for the challenges and opportunities that exist in the contemporary South African R&D space. The aim is to catalyse the development of new transformative capabilities in the country.

This means that TIA will play the role of facilitator of inbound technology transfer, ensuring that cutting-edge technologies and capabilities are brought into the country to enable the development of local scientists and researchers. The outcomes envisaged will result in an increase in the number of researchers, and new areas of research will also be started. With new research groups participating in international research consortia, it is envisaged that the decline in the output of R&D-related publications and patenting trends will be reversed.

The commercialisation of technologies developed in the NSI remains an untapped opportunity. This will be achieved through the modalities of licencing, assignment or outright sale of developed IP and technology packages, facilitated by TIA, to start-ups and existing enterprises. The sources of commercial opportunities include funded projects, cluster outputs and platform outputs. Commercialisation through partnerships with NIPMO and the private sector will be an increased focus – it is critical to exploit the hitherto untapped opportunity to evaluate the IP of state-owned entities. Doing so will be an opportunity to respond directly to the concerns raised in the HESTIIL review about the Agency's ability to meet the target of commercialising ventures in advanced technologies but also to resolve the challenges faced by the start-up ecosystem. Identifying technologically and commercially attractive innovations and taking them to higher TRLs, market readiness levels, and business readiness levels is what will attract significant follow-on funding, not least of which is the VC funding tied to incubators, accelerators, and venture studios.

The planned strategic initiatives in support of Outcome 2 are presented in Table 13.

Table 13: Strategic initiatives in support of Outcome 2

Topic	Challenge or opportunity	Strategic Initiative
Bio-entrepreneurship	Low-level support provided to bio-entrepreneurship	Review TIA's current interventions related to bio-entrepreneurship to ensure that the Agency's support meets the needs of the ecosystem, through several partnerships in the NSI. Launch a bio-entrepreneurship programme.
Bio-manufacturing	Lack of bio-manufacturing pilot facilities for entrepreneur support	Mobilise the stakeholders in the bio-manufacturing innovation space to develop a joint expansion plan for bioprocessing infrastructure to augment existing TIA offerings and improve efficiencies in serving the NSI. Do so through modalities such as the in-bound technology transfer from partner countries such as Cuba, India and Brazil.
Transformation broadly	Low response to underserved provinces and previously disadvantaged individuals	Deliver appropriate services to underserved provinces through appropriate mechanisms, which may include satellite interventions, or a wider-reaching initiative such as the launch of a new cluster focused on cannabis (in response to the Cannabis Masterplan).
Build new transformative capabilities in the NSI	Portfolio diversification for greater investment	Source new areas of investment for developing new transformative capabilities to support and elevate the existing country capacity in the bio-economy.

13.4 Resource considerations

Table 14: Bio-economy Division expenditure estimates

	2024/25 (R'000)	2025/26 (R'000)	2026/27 (R'000)
Income	**259 378**	**271 005**	**280 170**
MTEF ring-fenced	224 378	234 430	245 170
MTEF baseline	-	-	-
Other income (specific contracts, interest and royalties)	35 000	36 575	35 000
Operational expenditure	**60 079**	**62 822**	**56 869**
Support and infrastructure costs	15 784	16 534	13 639
Human resources	44 295	46 288	43 230
Investment expenditure	**199 299**	**208 183**	**223 300**
MTEF allocation	164 299	171 608	188 300
Specific contracts	35 000	36 575	35 000

14. Innovation Enabling

14.1 Outcome 3: SMMEs supported through strategically informed and regionally distributed Technology Stations

Impact statement

TIA aims to create jobs and opportunities by supporting technology-based SMMEs and co-operatives through its Technology Stations network.

Outcome statement

TIA aims to foster an enabling environment for innovation, with a specific focus on driving transformation and ensuring inclusion through the provision of SET and enterprise development services. To track TIA's progress towards achieving Outcome 3 during the 2020–2025 Strategic Plan period, TIA will report on the number of SMMEs accessing SET services annually.

14.2 Planned outputs and output targets

In order to foster an enabling environment for innovation, TIA has developed five outputs.

First, the Agency will establish new technology and innovation support centres with the purpose of providing SET support to companies and individuals in targeted regions. Second, TIA will support the provision of SET and lend enterprise development support to SMMEs and co-operatives for the purposes of developing innovative products or services, which will improve their revenue, growth and competitiveness.

Third, TIA will support the participation of high-level (honours and above) students and post-doc fellows in TIA-funded initiatives to give them industry-relevant project experience. This will include work-integrated learning for students studying towards technical degrees.

Fourth, the Agency will support the production of knowledge-based innovation products such as invention disclosures, patents, prototypes, technology transfer packages, technology demonstrators and plant-breeders' rights in pursuit of translating the outputs of scientific research and related knowledge into innovations.

Finally, TIA will track the funds received from third parties to investment initiatives for the purposes of funding technology development, technology commercialisation and related support activities. This measure will demonstrate the Agency's relevance in the NSI by leveraging its own funding with co-funding from industry, development finance institutions and organisations in the public sector.

TIA's output targets in support of providing enhanced inclusive access to SET and enterprise development support for SMMEs, grassroots innovators and co-operatives are presented in Table 15 and 17.

Table 15: Outcome 3 outputs, performance indicators and targets

Outputs	Output indicators	Audited actual performance			Estimated performance	MTEF period targets		
		2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
3.1 New centres established and supported	Number of new technology and innovation support centres providing SET support in targeted regions	1	3	8	8	9	10	12
3.2 SET and enterprise support provided to SMMEs and co-operatives	Number of SMMEs[11] and co-operatives receiving SET and enterprise development support	1 990	3 167	2 903	3 000	3 100	3 200	3 300
3.3 High-level human capital development for competitiveness and new industry development	Number of high-level students and post-doctoral fellows funded or co-funded	New indicator	96	195	130	150	175	180
3.4 Innovation products produced	Number of IP- and knowledge-based innovation products produced	49	179	197	200	220	250	255
3.5 Leveraged funds[12]	Total rand value leveraged	R1,37bn	R746,5m	R600,9m	R300m	R310m	R320m	R325m

Table 16: Outcome 3 output indicators and annual and quarterly targets

Output indicators	Annual Target	Q1	Q2	Q3	Q4
3.1 Number of new technology and innovation support centres providing SET support in targeted regions	9	0	2	3	4
3.2 Number of SMMEs and co-operatives receiving SET and enterprise development support	3 100	500	700	900	1 000
3.3 Number of high-level students and post-doctoral fellows funded or co-funded	150	0	50	0	100
3.4 Number of IP- and knowledge-based innovation products produced	220	40	40	60	80
3.5 Total rand value leveraged	R310m	R45m	R70m	R85m	R110m

[11] SMMEs include grassroots innovators.

[12] This was previously Output 1.5; it has been moved to Outcome 3, given the expanded interpretation of this outcome.

14.3 Explanation of planned performance

Through this outcome, TIA seeks to contribute to an enabling environment for innovation through a whole of society approach that supports a coherent and inclusive NSI. Interventions in this regard are well articulated in Chapter six of the Decadal Plan that defines the functional framework for enabling innovation consisting of several elements:

- Innovation funding from both private, public and non-government sectors.
- Enabling policy and regulatory environment.
- Modern knowledge and innovation infrastructure.
- Mechanisms for promoting innovation governances.
- Linkages and networks.
- Skills and innovation capacity of citizens and organisations.

To realise the strategic intents of this outcome, TIA will scale-up and implement, with greater intensity, the range of its existing innovation enabling programmes, and launch new ones where the gaps have been identified. For the current financial year, seven areas of intervention have been identified as discussed below.

Scaling-up funding and promoting funding efficiencies

The Seed Fund has proven to be an effective funding instrument for building a pipeline of bankable innovations from the universities and SMMEs where TIA partners with Offices of Technology Transfer (OTTs) and incubators in delivering this Programme. Efforts in the current year will focus on optimising the instrument by improving funding decision-making processes and other governance structures, especially on matters that have been raised by the implementing partners. The scale-up of the Industry Matching Fund will receive greater priority through as a partnership model to leverage resources and funding from the private sector. In this regard, TIA will build more partnerships with private sector including through their enterprise supplier development programmes.

Increase access to innovation infrastructure

TIA will continue its efforts to increase access for entrepreneurs, innovators, researchers and SMMEs to its suite of SET infrastructure support provided by the current network of 18 Technology Stations and eight Technology Platforms located at various institutions throughout the country. These facilities offer high-end SET support transferring technologies to innovators and SMMEs that improve the competitiveness and opportunities to develop new products and services. Measures are afoot to expand the range of these facilities where TIA, working with the DSI, are evaluating and developing a strategy to expand this model to TVET colleges.

In addition to this, TIA hosts and implements the Living Labs Programme, on behalf of the DSI, as a mechanism to promote core creation of technology solutions in rural and peri-urban environments in collaboration with end users. Living Labs, therefore, constitutes and important area of focus in the efforts to expand TIA's national footprint thereby increasing access to support for entrepreneurs in marginalised communities.

Use of public procurement to spur innovation

The use of public procurement as a lever to promote innovation is a specific strategic intent on the White Paper. It is consistent with the practice in many countries such the USA, UK, Australia, some parts of Europe and India that have successfully used public procurement as a lever to stimulate the development and procurement of locally developed technologies by researchers and SMMEs.

Public procurement in South Africa constitutes a huge market. However, its potential remains unexploited due to the challenging provisions of the PFMA and other regulatory requirements. In the current year, TIA will commence the process to establish and launch the SBRI for South Africa building on the programmes already on the way, that are managed on behalf of the DSI. These include the Technology Acquisition and Deployment Fund as an instrument, implemented on behalf of the DSI, to promote the demonstration and potential uptake of near market locally developed technologies and the Verification and Validation of Innovations for Service Delivery Programme that is aimed to encourage municipalities to use innovative solutions in addressing the service delivery challenges.

In this regard, TIA will partner with various Government departments at local and provincial levels to explore opportunities for collaboration in using innovation to improve their operations and addressing their service challenges. To date, 15 projects have been supported and the aim is to expand this support and increase its uptake into the future. This will serve as an important basis to build a strong business case for the establishment of a fully-fledged SBRI Instrument.

Strengthen the tech-entrepreneurship ecosystem

South Africa has an abundance of incubators and accelerators, alongside other such support intermediaries that offer office space, mentorship, and business development support. However, a significant gap remains in fast tracking the commercialisation of research output from publicly funded IP. Offices of Technology Transfer play an important role in identifying and supporting the commercialisation of research but results remain sub-optimal, especially when it relates to the formation of start-ups.

To address this gap, TIA will design and establish a Venture Builder Programme, targeted at researchers, innovators and other such technology entrepreneurs with late stage, near-market technologies to fast-track the development of technologies and rapid launch to market. Through this programme, TIA will offer bespoke services, inclusive of amongst others, mentorship, market validation, commercialisation feasibility assessments, market research, business plan development support, market entry and internationalisation. The Programme will also include a business partners platform to recruit commercially oriented partners into the start-ups and spinoffs.

Skills development for innovation and entrepreneurship

The need for skills development alongside RDI has become increasingly important for TIA. Embedding skills development within the Agency's programmes and interventions is important if an expanded offering is to be presented to entrepreneurs and citizens to combat South Africa's triple scourges of poverty, inequality, and unemployment, particularly in alignment with the country's draft Master Skills Plan.

TIA's primary intervention for skills development sits with the Innovation Skills Development Programme. However, it must be highlighted that various other programmes such the Technology Stations and Technology Platforms Programmes, along with the Youth and Cleantech Programmes provide different types of skills to young people in the innovation ecosystem.

Broadly speaking, the various skill sets provided by TIA through these programmes collectively are categorised as follows.

- **Innovation Skills** – aimed at providing students and graduates with SET skills through placement in industry and other technical environments such as Technology Stations and Technology Platforms.
- **Entrepreneurship Skills** – aimed at technology management and commercialisation professionals for placement in environments such as OTTs.
- **Commercialisation Management Skills** – aimed at technology management and commercialisation professionals for placement in environments such as OTTs.
- **Workplace Experiential Training** – aimed unemployed graduates to increase their chances of employability.
- **Critical Thinking Skills** – primarily, a programme for promoting a culture of innovation amongst students at school level, equipping them with basic skills for critical enquiry and analysis.

For the current financial year, TIA will implement two specific initiative which include establishing structured partnerships with the SETAs to design and implement specific skills development initiatives that respond to sector specific innovation needs. The organisation will design and implement the CHUMA Programme aimed at building a cohort of competent IP commercialisation managers for the benefit of the wider innovation ecosystem.

Strategic partnerships and stakeholder relations

Strategic partnerships at local and international level are an important enabler for TIA to succeed in executing its mandate. These partnerships contribute significant collateral capital in the form of funding, skills, market access, technology development capabilities and facilities.

Local partnerships

The growing dynamism of the South African innovation ecosystem has seen many players playing a role in innovation through the provision of funding and support for entrepreneurship development, amongst others. TIA's approach to strategic partnerships for the year will prioritise the following:

a. Linkages with the private sector to source co-funding and market access, including sourcing funding through their enterprise and supply development programmes. TIA will also grow its partnerships with the local venture capital sector, mainly with the view to leverage co-funding through its existing Industry Matching Fund and its deployment of the DSI Innovation Fund instrument, whilst promoting transformation within the VC sector.

b. The community of entrepreneurship support intermediaries such as incubators and accelerators that offer the requisite support to fledging tech-entrepreneurs.

c. Selected government departments at national and provincial level that offer opportunities for the development and deployment of innovations for service delivery purposes aligned to their mandates and strategic objectives. These partnerships will form the basis for TIA's establishment and launch of the SBRI Programme.

International partnerships

The Decadal Plan emphasises a shift in internationalisation from a singular focus on R&D to a science diplomacy approach focused on promoting collaboration on innovation. TIA has created and put in place partnerships with institutions from several countries around the world, in both developed and developing countries, including Africa, to pursue six strategic objectives:

- Promote bilateral collaborative RDI initiatives.
- Promote market access and international networking for promising local technologies.
- Facilitate focused capacity-building partnerships for skills transfer to TIA and the NSI.
- Attract investments into the NSI for technology innovation and commercialisation.
- Support regional and continental STI initiatives as contained in the African Union and the SADC Ministerial Declarations and Action Plans.
- Position TIA brand as the thought leader in innovation in Africa and beyond by hosting and participating in strategic international calls, platforms, events and conferences.

For the current financial year, TIA will implement five specific initiatives. These will include:

a. Establishment of a soft-landing programme to promote market access and partnering for South African start-ups with promising technologies.

b. Establish a SADC Innovation Programme building on the current Southern African Innovation Collective initiative Initiative as a framework to promote innovation, collaboration and ecosystem building amongst SADC countries.

c. Implement the outcomes of the South African Presidency of BRICS in 2023 through collaborative initiatives with Brazil, Russia, India and China. This will build on the agreements that TIA has signed with the relevant institutions in the respective countries.

d. Establish a structured partnership programme with the Department of Trade, Industry and Competition, leveraging on their Export Marketing Assistance Programme to undertake trade missions to selected countries with a view to promote exports of locally developed technologies.

e. Leveraging international funding for innovation and entrepreneurship through the European Commission's Horizon Europe initiative, philanthropic and other grant-making organisations.

Promote transformation and inclusive development

Transformation and inclusivity are two key principles that underpin TIA's efforts across all of its funding instruments and programmes. In the current financial year, more efforts will be made to build on TIA's past successes by implementing specific initiatives.

- TIA will work to expand the Grassroots Innovation Programme that it manages on behalf of the DSI, building on the current cohort of 180 innovators, some of whom have successfully commercialised their technologies. An expanded model of the Programme will be implemented in the financial year.
- TIA will also launch three stand-alone innovation programmes, each targeting the youth, women and persons with disabilities. These programmes have been designed to respond to the peculiar needs and challenges facing the respective constituent stakeholder groups. The programmes will be implemented through a decentralised model that uses delivery partners in the NSI to extend their reach nationally whilst leveraging on existing competencies and capabilities within the system.
- Working with the DSI, TIA will expand its portfolio of Living Labs, using its current portfolio of 14 Living Labs as measures to expand its spatial footprint nationally, mainly targeting underserved provinces thereby extending its support to communities in rural and peri-urban areas.

The planned strategic initiatives in support of Outcome 3 are presented in Table 17.

Table 17: Strategic initiatives in support of Outcome 3

Topic	Challenge or opportunity	Strategic initiative
Commercialising publicly funded R&D for socio-economic benefit	Limited capacity to commercialise promising technologies at historically disadvantaged HEIs	Implement a commercialisation capability-building programme at publicly funded research organisations (CHUMA) Implement a Venture Builder Programme
Transformation and inclusive innovation	The needs of women, youths and persons with a disability are not being given sufficient attention	Launch dedicated innovation support programmes that focus on women, youths and persons with disabilities-focused in support of inclusive innovation
Broad public expenditure on and support of RDI	Low or no funding allocated to innovation in the public sector	Establish a South African equivalent of the United States Small Business Innovation Research Programme
Co-ordination and leadership in national and regional innovation ecosystems	Regional innovation ecosystems in underserved provinces remain nascent and sub-optimal	Develop a Regional Innovation Strategy and plan for TIA, with an emphasis on underserved provinces. Delivery partners for transformation programmes will be sourced from regions
Promoting the African agenda	No regional innovation programme	Establish a SADC Innovation Programme
BRICS RDI Collaborative Initiatives	Leverage on opportunities created by South Africa's Presidency in 2023	Issue calls with individual BRICS countries

14.4 Resource considerations

Table 18: Innovation Enabling Division expenditure estimates

	2024/25 (R'000)	2025/26 (R'000)	2026/27 (R'000)
Income	**177 879**	**206 889**	**220 676**
MTEF ring-fenced	48 966	51 160	53 503
MTEF baseline	41 579	60 487	67 605
Other income (specific contracts, interest and royalties)	87 334	95 242	99 568
Operational expenditure	**29 451**	**30 535**	**31 668**
Support and infrastructure costs	5 360	5 360	5 360
Human resources	24 091	25 175	26 308
Investment expenditure	**148 428**	**176 353**	**189 008**
MTEF allocation	61 094	81 111	89 440
Specific contracts	87 334	95 242	99 568

15. Administration

TIA administration consists of the CEO's Office, Corporate Services, and the CFO's Office. It aims to provide an effective and efficient enabling environment for the Agency to enable it to achieve its mandate and deliver on its strategy.

15.1 Planned outputs and output targets

The administration seeks to provide an effective and efficient enabling environment for TIA to achieve its strategies by providing systems, processes and people and by prioritising appropriate resources (human and financial), in accordance with good corporate governance, legislative requirements and risk management practices. The Agency aims to deliver the outputs presented in Table 19 and Table 20.

Table 19: Administration outputs, performance indicators and targets

Outputs	Output indicators	Audited actual performance			Estimated performance	MTEF period targets		
		2020/21	2021/22	2022/23	2023/24	2024/25	2025/26	2026/27
A1.1 Good financial governance	Achieve an unqualified external audit opinion with no material financial matters in the audit report	Unqualified external audit opinion	Unqualified external audit opinion with no material matters in the audit report	Clean audit opinion (unqualified audit opinion with no matters of emphasis)	Clean external audit opinion	Clean external audit opinion	Clean external audit opinion	Clean external audit opinion
A1.2 Improved investment decision turnaround time for funding applications[13]	(a) Investment decision turnaround time for funding applications <R1m	New indicator	Did not achieve the 4-week turnaround time target (average was 18,9 weeks)	48 out of 93 applications assessed within four weeks (52%)	Achieve a 4-week turnaround time	Achieve a 4-week turnaround time	Achieve a 4-week turnaround time	Achieve a 4-week turnaround time
	(b) Investment decision turnaround time for funding applications >R1m & <R15m	New indicator	Did not achieve the 15-week turnaround time target (average was 19,6 weeks)	89 out of 107 applications assessed within 15 weeks (83%)	Achieve a 15-week turnaround time	Achieve a 15-week turnaround time	Achieve a 15-week turnaround time	Achieve a 15-week turnaround time
	(c) Investment decision turnaround time for funding applications >R15m	New indicator	Did not achieve the 26-week turnaround time target (no decisions had been taken by 31 March 2022)	2 out of 2 applications assessed within 26 weeks (100%)	Achieve a 26-week turnaround time	Achieve a 26-week turnaround time	Achieve a 26-week turnaround time	Achieve a 26-week turnaround time
A1.3 Support transformation initiatives in underserved provinces	Allocation of funds to underserved provinces	New indicator	New indicator	R43,63m	30% of available investment funds allocated	30% of available investment funds allocated	30% of available investment funds allocated	30% of available investment funds allocated
A1.4 Support transformation of TIA's investment portfolio	Allocation of funds to transformed recipients[14]	New indicator	New indicator	R30,83m	At least 40% of available investment funds allocated	At least 50% of available investment funds allocated	At least 50% of available investment funds allocated	At least 50% of available investment funds allocated

[13] The time frame in each target reflects the time taken at TIA in line with its assessment and approval processes and does not include time that potential applicants may spend in developing and refining their applications.

[14] In this instance a "recipient" is a funding recipient, i.e. an investee of TIA.

Table 20: Administration output indicators and annual and quarterly targets

Output indicators	Annual target	Q1	Q2	Q3	Q4
A1.1 Achieve an unqualified external audit opinion with no financial matters in the audit report	Unqualified external audit opinion with no financial matters in the audit report	No target	Clean external audit opinion	No target	No target
A1.2(a) Investment decision turnaround time for funding applications <R1m	Achieve a 4-week turnaround time	No target	No target	No target	Achieve a 4-week turnaround time
A1.2(b) Investment decision turnaround time for funding applications >R1m & <R15m	Achieve a 15-week turnaround time	No target	No target	No target	Achieve a 15-week turnaround time
A1.2(c) Investment decision turnaround time for funding applications >R15m	Achieve a 26-week turnaround time	No target	No target	No target	Achieve a 26-week turnaround time
A1.3 Allocation of funds to underserved provinces	At least 30% of available investment funds allocated	No target	No target	No target	At least 30% of available investment funds allocated
A1.4 Allocation of funds to transformed recipients	At least 50% of available investment funds allocated	No target	No target	No target	At least 50% of available investment funds allocated

15.2 Explanation of planned performance

TIA will pursue the realisation of the set objectives under administration through several specific interventions. These will involve placing emphasis on the audit outcomes of TIA investments with a view of promoting efficient use of public funds in line with the prescripts of the PFMA and financial accountability. TIA will continue to promote the use of the investment onboarding toolkit by new investees. This focus will also include an audit of TIA Programmes, including hosted programmes to ensure their alignment with TIA policies and the PFMA.

TIA will put additional measures to promote improved turnaround time for decision-making, building on the gains from the last financial year. In addition to previously implemented initiatives, inclusive of revisions to the Delegations of Authority, implementation of the Enterprise Resource Management System and establishment of the database of external experts.

Other additional measures of the year will include of the following specific initiatives:

- Implementing a pre-investment application building instrument that will improve the quality of applications to ensure smooth and efficient processing of applications.
- Introducing a deal team approach to due diligence and investment assessment thus minimising the time lag between the various due diligence components (legal, financial, IP, technical and commercial).
- Expanding the current database of external experts and increasing its adoption internally.
- Implementing a Post-Investment Management Structure as part of the organisational realignment towards TIA 2.0, enabling clear segregation of duties amongst Portfolio Managers.
- Increasing the use of the existing Enterprise Resource Management System and expanding the system to the growing pool of TIA-funded stakeholders.

To promote the imperatives of inclusivity and transformation (demographic and spatial), TIA will set aside dedicated funds from the MTEF to be directed towards previously marginalised communities. In this regard, TIA will provide seed funding, and seek partnerships with industry and government departments to launch individual programmes for youth, women and persons with disabilities. TIA will also identify partnership opportunities to scale the individual programmes within the Innovation for Inclusive Development portfolio currently managed on behalf of the DSI.

The administration has the following strategic initiatives (Table 21).

Table 21: Strategic initiatives in support of Administration

Topic	Challenge or opportunity	Strategic initiative
Stakeholder satisfaction	Long investment approval turna-round times	Comprehensively resolve limiting factors to shorten turnaround times, including: • Tailoring funding processes and funding application assessment toolkits according to funding thresholds and Delegation of Authority levels • Using tiered and staged milestone-based funding approvals for high-value applications • Expanding the panel of external experts • Applying funding instruments flexibly under a new paradigm • Implementing a fund-of-funds approach to programmes managed, where appropriate
Internal systems	Data system limitations (use and capability) and performance data limitations (quality and availability)	• Finalise the design and implement the Enterprise Resource Management System • Re-establish and resource the business intelligence function
Efficiency of internal capacity	Current approach of investment lifecycle management by programme/portfolio managers is leading to portfolio loading challenges	Design and implement a Pre-investment, Investment and Post-Investment Management Structure strategy and structure
Financial resources	Limited financial resources to meet growing project pipeline funding requirements	Explore fundraising by exploring a fund-of-funds approach in raising capital from external investors

15.3 Resource considerations

Table 22: Support Division expenditure estimates

	2024/25 (R'000)	2025/26 (R'000)	2026/27 (R'000)
Income	**58 353**	**60 979**	**71 759**
MTEF ring-fenced	-	-	
MTEF baseline	19 851	13 479	17 596
Other income (specific contracts, interest and royalties)	38 502	47 500	54 163
Operational expenditure	**58 353**	**60 979**	**71 759**
Support and infrastructure costs	22 223	23 223	27 163
Human resources	36 130	37 756	44 596

16. Institutional Resource Considerations

Operational costs

Support and infrastructure cost allocations have been prepared using a zero-based budgeting process that focuses on improving the efficiency ratio in the Agency through cost-saving initiatives. Human resource costs have been budgeted in line with the previous year, again focusing on improving the efficiency ratio. This has been achieved by filling only critical vacancies. In line with the National Treasury spending review recommendations, approximately only 10% of funding has been directed towards operational costs.

Investment funding

Given current economic conditions, investment funding remains a challenge as applications for funding far exceed the funding available. This is mitigated by leveraging funds for projects from other parties, including the co-funding of projects.

Other income

Funding is an important factor that enables TIA to enhance its de-risking role as the primary funder of early-stage technology innovations in the NSI. To this end, the Agency pursues strategies that strengthen its funding base, especially under the current constrained fiscal conditions. The organisation has shown that it has the ability to implement specific programmes adequately. As a result, the Agency has seen an increase in the number and value of specific contracts with the DSI.

The Agency will continue to focus on obtaining other sources of income to support its programmes and project funding initiatives, including remedying the significant underfunding of its commercialisation mandate. This will be done through contract-specific funds obtained from the DSI, including the Innovation Fund, and also other government institutions, and through partnerships with the public and private sectors (using the Hub and Spoke model).

Maturing technology development projects are expected to yield financial returns in the form of royalties, loan repayments and other forms of commercialisation. With effective working capital management, the Agency aims to maximise interest earned on cash reserves deposited with the Corporation for Public Deposits at the South African Reserve Bank. The returns generated will be used to fund innovation initiatives.

Table 23: TIA budget allocation for the MTEF period 2024/25 to 2026/27

	Budget 2024/25 R' 000	Budget 2025/26 R' 000	Budget 2026/27 R' 000
Administration	**174 521**	**181 904**	**188 836**
Support and infrastructure cost	49 328	51 077	52 122
Human resources	125 193	130 827	136 714
Investments	**419 031**	**467 457**	**508 591**
Bio-economy	**199 299**	**208 183**	**223 029**
Ring-fenced	164 299	171 608	188 029
Specific contracts	35 000	36 575	35 000
Technology Stations	**92 013**	**96 735**	**99 110**
Ring-fenced	46 862	45 575	45 607
Specific contracts	45 151	51 160	53 503
Commercialisation	**71 304**	**82 921**	**96 554**
Innovation enabling	**56 415**	**79 618**	**89 898**
Baseline	12 282	27 475	34 491
Specific contracts	44 133	52 143	55 407
Total expenditure	**593 551**	**649 361**	**697 427**
Total funding received	**593 551**	**649 362**	**697 427**
Allocation from the DSI	432 715	470 045	508 754
Baseline (Other than Bio-economy and Technology Stations)	159 371	184 455	210 081
Bio-economy	224 378	234 430	245 170
Technology Stations	48 966	51 160	53 503
Additional income target	122 334	131 817	134 568
Other Income	28 002	34 000	40 000
Interest	10 500	13 500	14 105
Surplus/(Deficit)	-	-	-
Capex allocation:	8 000	5 000	5 000
Efficiency ratio	**10%**	**9%**	**10%**

While anticipated, formal advice of the final MTEF budget allocation has not been received from the DSI and therefore TIA's budget has been prepared based on previously communicated numbers

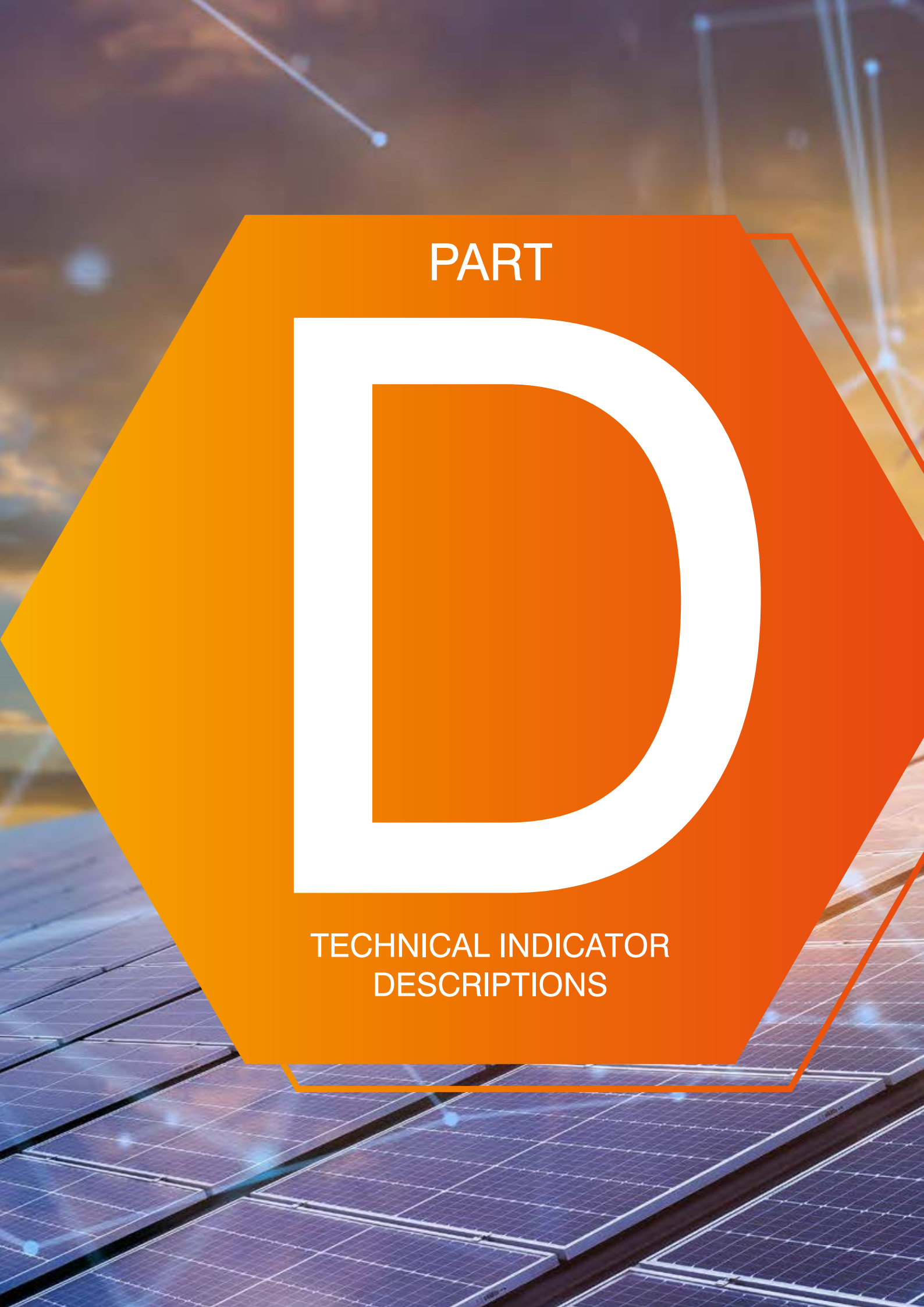
17. Updated Key Risks and Mitigation from Strategic Plan

Stemming from the Strategic Plan, TIA employs a robust, systematic process at both the operational and the strategic level. This process is integrated into and central to its strategic planning process. The methodology applied is derived from the prescripts of the Committee of Sponsoring Organisations of the Treadway Commission: Enterprise Risk Management Integrated Framework, ISO31000 on Enterprise Risk Management Framework, the National Treasury's Public Sector Risk Management Framework, the Institute of Risk Management South Africa's risk principles and TIA's own Enterprise Risk Management Policy. The Agency manages its risks at the strategic, operational and project levels.

Table 24 outlines the key risks relating to TIA's outcomes, together with identified risk-mitigation measures.

Table 24: Strategic risks and mitigation plans (2020–2025)

Outcome	Key risk	Risk mitigation
Outcome 1: Commercialised innovations	Failure to translate technologies funded and developed into commercial ventures	• Establish appropriate partnerships and instruments to ensure the uptake of TIA investments • Build relationships with accelerators for innovation and business development support services • Establish and implement a TIA Venture Builder programme
	Low market uptake of and access to funded innovations	• Build and develop investment portfolio and technologies in partnerships with industry (market-led investment strategy)
Outcome 2: Delivering on the Bio-economy Strategy	Sub-optimal implementation of the Bio-economy Strategy due to insufficient co-ordination	• Implement strategic bio-innovation multi-stakeholder programmes • TIA will establish closer relationships with the DSI, to understand better the DSI programmes and initiatives
Outcome 3: SMMEs supported through strategically informed and regionally distributed Technology Stations	Inability of SMMEs to meet the growing demand for SET and enterprise development services	• Broaden access to SMMEs through the establishment of additional centres, particularly in underserved provinces • Secure additional resources to upgrade the capabilities of Technology Stations, including inculcating a 4IR approach
	Inability of Technology Stations and other implementing partners to meet the needs of SMMEs for competitiveness improvements and growth	



PART D

TECHNICAL INDICATOR DESCRIPTIONS

Outcome 1

Commercialised innovations

Indicator title	1.1 Number of licensed or assigned technologies
Definition	IP that has been licensed, assigned or sold to a third party for the purpose of commercialisation, including both registrable and non-registrable IP
Source of data	Programme and project databases Reports Contracts or agreements
Method of calculation	Simple count
Means of verification	Verification of supporting documentation
Assumptions	IP has been created
Disaggregation of beneficiaries	Women-owned businesses or women entrepreneurs: ≥30% Youth-owned businesses or youth entrepreneurs: ≥20% Entrepreneurs who are persons with disabilities or businesses owned by persons with disabilities: ≥10%
Spatial transformation (DDM)	To be informed by and aligned with the priorities of the government's 2019–2024 MTSF, in support of the DSI
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	To meet or exceed the target set Acceptable performance: achievement of 90% of the target
Indicator responsibility	Executive: Commercialisation (supported by Executive: Innovation Enabling)

Indicator title	1.2 Number of projects involving industry being executed
Definition	Number of collaborative projects or businesses, or initiatives or programmes, with the private sector in developing and/or commercialising the technology. The collaboration can be either financial or non-financial. The joint collaborations must be between publicly funded research organisations (inclusive of publicly funded HEIs and science councils) and industry
Source of data	Programme or project databases Reports Contracts or agreements
Method of calculation	Simple count
Means of verification	Verification of supporting documentation
Assumptions	Projects or businesses, or initiatives or programmes, have existing or new partnerships with the private sector
Disaggregation of beneficiaries	Women-owned businesses or women entrepreneurs: ≥30% Youth-owned businesses or youth entrepreneurs: ≥50% Entrepreneurs who are persons with disabilities or businesses owned by persons with a disabilities: ≥10%
Spatial transformation (DDM)	To be informed by and aligned with the priorities of the government's 2019–2024 MTSF, in support of the DSI
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	To meet or exceed the target set Acceptable performance: Achievement of 90% of the target
Indicator responsibility	Executive: Commercialisation (supported by Executive: Innovation Enabling)

Indicator title	1.3 Number of successfully diffused technologies
Definition	Number of technologies that have been introduced into the market (community structures, SMMEs, co-operatives and other business formations) for social gain, directly or indirectly (products, processes or services)
Source of data	Programme or project databases Reports Contracts or agreements Invoices Testimonies Publications
Method of calculation	Simple count
Means of verification	Verification of supporting documentation
Assumptions	Availability and approval of funding Innovation outputs developed successfully to demonstration stage (or higher) where there is a market for social diffusion A diffused technology can be counted more than once only if a derivative, modified or customised version of the original technology is diffused
Disaggregation of beneficiaries	Women-owned businesses or women entrepreneurs: ≥30% Youth-owned businesses or youth entrepreneurs: ≥50% Entrepreneurs who are persons with a disability or businesses owned by persons with a disability: ≥10%
Spatial transformation (DDM)	To be informed by and aligned with the priorities of the government's 2019–2024 MTSF, in support of the DSI
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	To meet or exceed the target set Acceptable performance: Achievement of 90% of the target
Indicator responsibility	Executive: Commercialisation (supported by Executive: Innovation Enabling)

Indicator title	1.4 Number of products launched
Definition	The number of products that have been successfully launched in the market by start-ups or SMMEs
Source of data	Programme or project databases Reports Contracts or agreements
Method of calculation	Simple count
Means of verification	Verification of supporting documentation
Assumptions	The product is fully developed and ready for market entry A product launched can be counted more than once only if a derivative modified or customised version of the original product is launched
Disaggregation of beneficiaries	Women-owned businesses or women entrepreneurs: ≥30% Youth-owned businesses or youth entrepreneurs: ≥50% Entrepreneurs who are persons with disabilities or businesses owned by persons with disabilities: ≥10%
Spatial transformation (DDM)	To be informed by and aligned with the priorities of government's 2019–2024 MTSF, in support of the DSI
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	To meet or exceed the target set Acceptable performance: Achievement of 90% of the target
Indicator responsibility	Executive: Commercialisation (supported by Executive: Innovation Enabling)

Indicator title	1.5 Total rand value of royalties, sales and exits
Definition	The amount of funds derived from commercialised innovations. This includes the tracking of royalty payments, revenue generated through the sales of TIA-supported products, processes and services, and redemptions from exits
Source of data	Programme or project databases/royalty register Invoices, statements, and GL/financials Contracts/awards or agreements/letters of Intent Audited certificate of sales figures
Method of calculation	Simple count of the combined value of royalty payments, revenue generated through the sales of TIA-supported products, processes and services and redemptions from exits. Levy calculation against sales figures
Means of verification	Verification of supporting documentation
Assumptions	Third parties have available funds to spend on innovation; the ability to repay does not stifle the growth of the company/tech
Disaggregation of beneficiaries	N/A
Spatial transformation (DDM)	N/A
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	To meet or exceed the target set Acceptable performance: Achievement of 90% of the target
Indicator responsibility	Executive: Commercialisation

Outcome 2

Delivering on the Bio-economy Strategy

Indicator title	2.1 Number of successfully demonstrated bio-based technologies
Definition	Bio-based technologies, products or services that have reached demonstration stage in agriculture, health, industrial biotechnology, IKS and other bio-based domains. Bio-based refers to a technological application that uses biological systems, living organisms or derivatives of them to make or modify products or processes. This includes diagnostic kits, bio-processes, technology packages and allied
Source of data	Programme or project databases Reports Contracts or agreements
Method of calculation	Simple count
Means of verification	Verification of supporting documentation
Assumptions	Availability and approval of funding
Disaggregation of beneficiaries	Women-owned businesses or women entrepreneurs: ≥30% Youth-owned businesses or youth entrepreneurs: ≥20% Entrepreneurs who are persons with disabilities or businesses owned by persons with disabilities: ≥10%
Spatial transformation (DDM)	To be informed by and aligned with the priorities of the government's 2019–2024 MTSF, in support of the DSI
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	To meet or exceed the target set Acceptable performance: Achievement of 90% of the target
Indicator responsibility	Executive: Bio-economy

Indicator title	2.2 Number of Technology Platforms that are operational and functional
Definition	The number of Technology Platforms that are operational and/or functional and which are supported by TIA to meet the needs of beneficiaries and stakeholders and develop into high-performing and capable facilities
Source of data	Programme or project databases Reports Contracts or agreements Approved budgets or proof that funds are available Operational plans
Method of calculation	Simple count
Means of verification	Verification of supporting documentation
Assumptions	Adequate funding and resources are made available (disbursement) or obtained from third parties to assist with the funding of such facilities
Disaggregation of beneficiaries	N/A
Spatial transformation (DDM)	To be informed by and aligned with the priorities of the government's 2019–2024 MTSF, in support of the DSI
Calculation type	Non-cumulative
Reporting cycle	Bi-annually (in Q2 and Q4)
Desired performance	Platforms are functional and operational Acceptable performance: Achievement of 90% of the agreed targets towards being functional or operational
Indicator responsibility	Executive: Bio-economy

Indicator title	2.3 Number of Technology Innovation Clusters that are operational and functional
Definition	The number of Technology Innovation Clusters that are operational and/or functional which that are supported by TIA to undertake innovation projects and activities in support of targeted industries and regions
Source of data	Programme or project databases Reports Contracts or agreements Approved budgets or proof that funds are available Operational plans
Method of calculation	Simple count
Means of verification	Verification of supporting documentation
Assumptions	Adequate funding and resources are made available (disbursement) or obtained from third parties to assist with the funding and establishment of such facilities
Disaggregation of beneficiaries	N/A
Spatial transformation (DDM)	To be informed by and aligned with the priorities of the government's 2019–2024 MTSF, in support of the DSI
Calculation type	Non-cumulative
Reporting cycle	Bi-annually (in Q2 and Q4)
Desired performance	Clusters are functional and operational Acceptable performance: Achievement of 90% of the agreed targets towards being functional or operational
Indicator responsibility	Executive: Bio-economy

Outcome 3

SMMEs supported through strategically informed and regionally distributed Technology Stations

Indicator title	3.1 Number of new technology and innovation support centres providing SET support in targeted regions
Definition	The establishment of new centres (technology and innovation support centres or other centres providing a similar service) in targeted regions based on government's spatial development priorities. Technology and innovation support centres are centres that provide SET services and support to SMMEs which are not necessarily hosted by universities
Source of data	Programme or project databases Reports Contracts or agreements
Method of calculation	Simple count
Means of verification	Verification of supporting documentation
Assumptions	Adequate funding and resources are made available (disbursement) or obtained from third parties to assist with the funding and establishment of such facilities Willing hosts, champions and shareholders (including the DSI) commit and agree to the establishment of such facilities
Disaggregation of beneficiaries	N/A
Spatial transformation (DDM)	To be informed by and aligned with the priorities of the government's 2019–2024 MTSF, in support of the DSI
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	Centres that are operational and functional
Indicator responsibility	Executive: Innovation Enabling

Indicator title	3.2 Number of SMMEs and co-operatives receiving SET and enterprise development support
Definition	SMMEs and co-operatives that access SET support for the purposes of developing innovative products or services through the financial or non-financial support of TIA-funded initiatives
Source of data	Programme or project databases Reports Contracts or agreements Quotations or invoices Attendance registers and training manuals Proof of payments Proof of consultation Proof of identity Proof of company registration Customer feedback report/acceptance of work/delivery note/project sign-off/record of service
Method of calculation	Simple count of number of SMMEs supported in the financial year. An individual or SMME supported more than once in the financial year can be counted only once for reporting purposes
Means of verification	Verification of supporting documentation
Assumptions	An adequate number of SMMEs and co-operatives will be interested in the services offered by Technology Stations, possess adequate expertise and have access to adequate funding to provide and maintain the infrastructure required for SET support
Disaggregation of beneficiaries	Entrepreneurs who are historically disadvantaged individuals or businesses owned by historically disadvantaged individuals: ≥80% Women-owned businesses or women entrepreneurs: ≥45% Youth-owned businesses or youth entrepreneurs: ≥40% Entrepreneurs who are persons with disabilities or businesses owned by persons with disabilities: ≥3%
Spatial transformation (DDM)	To be informed by and aligned with the priorities of the government's 2019–2024 MTSF, in support of the DSI. The focus will be on targeting historically disadvantaged individuals
Calculation type	Cumulative
Reporting cycle	Quarterly

Indicator title	3.2 Number of SMMEs and co-operatives receiving SET and enterprise development support
Desired performance	To meet or exceed the target set Acceptable performance: Achievement of 90% of the agreed target
Indicator responsibility	Executive: Innovation Enabling

Indicator title	3.3 Number of high-level students and post-doctoral fellows funded/co-funded
Definition	Students enrolled at universities or universities of technology for an honours, master's or doctoral qualification or work-integrated learning (equivalent and above) participating in fully funded or co-funded TIA initiatives
Source of data	• Annual registration letter (proof of enrolment) from the HEI where the student is registered (proof of registration on an official letterhead of the HEI, stamped and signed) • A letter from the Technology Station or from other TIA projects confirming the student is supported through TIA initiatives The Excel database will include additional profile information that is required for management and analytical purposes. The proof of registration will be accepted as valid for a specific calendar year
Method of calculation	Simple count
Means of verification	Verification of supporting documentation
Assumptions	Number of high-level research graduates participating in TIA-funded activities to acquire adequate expertise and training in SET fields
Disaggregation of beneficiaries	Historically disadvantaged individuals: ≥80% Women: ≥45% Youth: ≥40% persons with disabilities: ≥3%
Spatial transformation (DDM)	To be informed by and aligned with the priorities of the government's 2019–2024 MTSF, in support of the DSI
Calculation type	Cumulative
Reporting cycle	Quarterly in Q2 and Q4
Desired performance	To meet or exceed the target set Acceptable performance: Achievement of 90% of the agreed target
Indicator responsibility	Executive: Innovation Enabling

Indicator title	3.4 Number of IP and knowledge-based innovation products produced
Definition	Knowledge or innovation product: the output (discrete intermediate steps or finalisation) of knowledge or innovation (process, market, product or improved service delivery) that is quantifiable (e.g. invention disclosure, patent, prototype, technology transfer package, technology demonstrator, plant-breeders' rights, etc.). It should be noted that different technologies and processes have slightly different phases, conventions and names
Source of data	Programme or project databases Register of knowledge and innovation products Quotations or invoices (scope of work) Reports Acceptance of work/delivery note/project sign-off
Method of calculation	Simple count
Means of verification	Verification of supporting documentation
Assumptions	Researchers lodge their IP outputs through formal channels in the Office of Technology Transfer of the university or science council as per the IPR Act. Publicly funded research organisations have existing frameworks to categorise the different types of knowledge-based product
Disaggregation of beneficiaries	Historically disadvantaged individuals: ≥80% Women: ≥45% Youth: ≥40% Persons with disabilities: ≥3%
Spatial transformation (DDM)	To be informed by and aligned with the priorities of the government's 2019–2024 MTSF, in support of the DSI
Calculation type	Cumulative
Reporting cycle	Quarterly

Indicator title	3.4 Number of IP and knowledge-based innovation products produced
Desired performance	To meet or exceed the target set Acceptable performance: Achievement of 90% of the agreed target
Indicator responsibility	Executive: Innovation Enabling

Indicator title	3.5 Total rand value leveraged
Definition	The amount of funds contributed by third parties to investment initiatives for the purposes of funding technology development, technology commercialisation and related support activities
Source of data	Programme or project databases Award letters Funding confirmation letters Contracts or agreements
Method of calculation	Simple count of the value of signed agreements entered into with third parties (TIA's co-investment with third parties, financial and/or follow-on funding)
Means of verification	Verification of supporting documentation
Assumptions	Third parties will continue to have available funds to spend on innovation
Disaggregation of beneficiaries	N/A
Spatial transformation (DDM)	To be informed by and aligned with the priorities of the government's 2019–2024 MTSF, in support of the DSI
Calculation type	Cumulative
Reporting cycle	Quarterly
Desired performance	To meet or exceed the target set Acceptable performance: Achievement of 90% of the target
Indicator responsibility	Executive: Commercialisation (supported by Executive: Innovation Enabling and Executive: Bio-economy)

Administration

Effective and efficient internal environment to effect the strategy

Indicator title	A1.1 Achieve a clean external audit opinion
Definition	An unqualified audit opinion on the audited annual financial statements of the previous financial year as presented by the appointed external auditors. It is an independent statement of the compliance of the entity with the regulatory frameworks, with no matters identified in the audit report
Source of data	External audit report
Method of assessment	External auditors' report. The auditors' opinion is the only means of assessment. A qualified opinion means that management did not comply with certain prescripts and therefore did not meet the minimum expected standards of financial performance. Unqualified means that the entity performed at an acceptable level. Clean audit means that the organisation exceeded the expected standard and that its policies are effective
Means of verification	Audit report from the appointed external auditors Financial statements, trial balance and detailed reports
Assumptions	Compliance with regulatory frameworks, policies and National Treasury instruction notes. Assessment of materiality after consideration of materiality framework. Previous-year recurring matters (carried over) to not affect the achievement of the target
Disaggregation of beneficiaries	N/A
Spatial transformation (DDM)	N/A
Calculation type	Non-cumulative
Reporting cycle	Annually in Q2 (2023/24 financial year audit opinion)
Desired performance	To meet or exceed the target set Acceptable performance: Unqualified audit opinion with matters of emphasis High performance: Clean audit opinion
Indicator responsibility	Board and Audit and Risk sub-committee Executive Management Committee

Indicator title	A1.2 Improved investment decision turnaround time for funding applications
Definition	Investment decision turnaround time is measured as the time taken by TIA to process and conclude funding applications, from receipt of a full funding application until when an investment decision is taken. The desired investment decision turnaround time is determined by the quantum of funding
Source of data	System-generated report or Excel spreadsheet with turnaround time calculations Date of receipt of a full funding application (e.g. system screen shot, emails) Date of investment decision, as per the delegation of authority Evidence of check-outs and check-ins when applicable
Method of calculation	(Number of full funding application assessment decisions concluded within the targeted turnaround time) / (Total number of full funding applications received) x 100%
Means of verification	Verification of supporting documentation
Assumptions	All transaction information is accurately recorded on the investment system. Open funding applications (where an investment decision has not yet been made) are excluded from calculations. The time taken by the applicant to respond to questions and to provide more information will be deducted from the total time taken for each individual application from receipt of a full application until when an investment decision is taken
Disaggregation of beneficiaries	N/A
Spatial transformation (DDM)	N/A
Calculation type	Non-cumulative
Reporting cycle	Annually in Q4
Desired performance	To meet or exceed the target set Acceptable performance: Meeting the targeted turnaround times in 70% of instances
Indicator responsibility	Executive: Commercialisation Executive: Bio-economy Executive: Innovation Enabling

Indicator title	A1.3 Allocation of funds to underserved provinces
Definition	Available investment funds directed to support innovation projects and initiatives in underserved provinces
Source of data	Programme or project databases Agreements or contracts
Method of calculation	Simple count of the value of signed agreements entered into with recipients (i.e. investees) in underserved provinces divided by (the total value of uncommitted funds at the beginning of the financial year minus total value of unspent funds at the end of the financial year) as a percentage Uncommitted funds exclude multi-year contractual commitments as part of agreements signed in previous years and also funds earmarked for deployment under existing programmes
Means of verification	Verification of supporting documentation
Assumptions	Availability of sufficient unspent and uncommitted funds as at 1 April 2024 Willing partners/funding recipients Funds are to be spent in underserved provinces
Disaggregation of beneficiaries	N/A
Spatial transformation (DDM)	Recipients or investees in the Northern Cape, Limpopo, Free State, Eastern Cape, North West and Mpumalanga provinces Supports the DSI's selected district and metropolitan municipalities (e.g. Ugu, Zululand and Ekurhuleni)
Calculation type	Cumulative
Reporting cycle	Annually in Q4
Desired performance	To meet or exceed the target set Acceptable performance: Achievement of 80% of the target
Indicator responsibility	Executive: Commercialisation Executive: Bio-economy Executive: Innovation Enabling

Indicator title	A1.4 Allocation of funds to transformed recipients
Definition	Available investment funds directed to black recipients
Source of data	Programme or project databases Agreements or contracts
Method of calculation	Simple count of the value of signed agreements entered into with transformed or black recipients (i.e. investees) divided by (the total value of uncommitted funds at the beginning of the financial year minus total value of value of unspent funds at the end of the financial year) as a percentage Uncommitted funds exclude multi-year contractual commitments as part of agreements signed in previous years and also funds earmarked for deployment under existing programmes
Means of verification	Verification of supporting documentation
Assumptions	Availability of sufficient unspent funds as at 1 April 2024 Willing partners, funding recipients or investees
Disaggregation of beneficiaries	Black recipients with a minimum black ownership of 30% or recipients or investees who are at B-BBEE Level 4 or better
Spatial transformation (DDM)	N/A
Calculation type	Cumulative
Reporting cycle	Annually in Q4
Desired performance	To meet or exceed the target set Acceptable performance: Achievement of 80% of the target
Indicator responsibility	Executive: Commercialisation Executive: Bio-economy Executive: Innovation Enabling

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